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ABSTRACT

This volume compiles and reprints the responses of 37 organizations to a series of questions issued by the House Committee on Agriculture in anticipation of debates concerning the Research Title of the 1995 Farm Bill due for updating and revision. The questions address some of the following topics: the role of the federal government in agricultural research, coordination and relations with other federal agencies, the suitability of various regulations and procedures, setting research priorities, integrating federal-state-industry research pools, effectiveness of coordinating and advisory boards, efficiency and accountability in administration of these federal funds, partnerships with other types of organizations, guidelines for use of federal funds, land grant universities' roles, fund allocation formulas, and regional research and extension cooperation. The organizations that responded to these questions include the Department of Agriculture, the Coalition on Funding Agricultural Research Mission, professional societies such as the Phytopathological Society and the Entomological Society of America, individual higher education institutions like the Universities of Minnesota and Arkansas and Ohio State University, international organizations such as the World Bank and the International Food Policy Research Institute, and Associations such as the American Feed Industry Association and the Association of American Veterinary Medical Colleges. (JB)

ED 391 447

104th Congress
1st Session } COMMITTEE PRINT

COMPILATION OF AGRICULTURAL RESEARCH, EDUCATION, AND EXTENSION QUESTIONS FOR DISCUSSION

PREPARED BY THE STAFF

COMMITTEE ON AGRICULTURE
U.S. HOUSE OF REPRESENTATIVES

DECEMBER 1995

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Printed for the use of the Committee on Agriculture

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104th Congress
1st Session

COMMITTEE PRINT

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DEPARTMENT OF AGRICULTURE
OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20250

November [illegible]

Honorable Pat Roberts
Chairman
Committee on Agriculture
U.S. House of Representatives
1301 Longworth House Office Building
Washington, D.C. 20515-6001

Dear Mr. Chairman:

Thank you for the opportunity to share my views on the future of agricultural research, education, and extension in response to the 57 questions you submitted to me this summer.

Many of the responses I am providing reflect the ideas and proposals put forth in The 1995 Farm Bill: Guidance of the Administration, published this spring. The Administration proposes new, outcome-oriented research purposes; the creation of a single National Research, Education, and Economics Advisory Committee; an Agricultural Research Facilities Study Commission; a new competitive research facilities grant program; and a competitive special grant program for research. We also propose the creation of a Research, Education, and Economics Policy Council to better coordinate and serve the research needs of the Department of Agriculture's program and regulatory agencies.

We have advocated many of these proposals in discussions with the Senate Agriculture Committee as it has proceeded to draft the 1995 Farm Bill research title. We look forward to presenting these proposals in greater detail when you begin hearings next spring.

Sincerely,

Dan Glickman

DAN GLICKMAN
Secretary

Enclosure

AN EQUAL OPPORTUNITY EMPLOYER

1. What should be the role of the Federal Government in agricultural research?

The 1995 Farm Bill Guidance of the Administration outlines five outcomes for Federally funded agricultural research. The Federal Government's role in agricultural research is to solve problems and create new economic opportunities. This Administration is focusing agricultural research to 1) enhance economic opportunity for rural people and farmers, 2) support a healthier, better-educated citizenry, 3) reduce risk for consumers and farmers, 4) enhance global competitiveness, and 5) protect the natural resource base for society.

The area of enhanced economic opportunity involves: research on global marketing and domestic marketing assistance for family farmers; new crops and new uses; increased and improved technology transfer for family farmers, and management practices and technologies appropriate for beginning and socially disadvantaged farmers. Enhanced opportunity for all rural residents would focus on "new uses" and value-added processing that can most effectively be done close to the source farms.

With special attention to the 15 percent of farms that produce more than 80 percent of all food and fiber, risk-reduction options would include new food safety inspection technologies, food handling and nutrition research for consumers, research and development to understand and mitigate weather variability; and development of non-regulatory approaches to environmental problems. Attention to the long-term issues of national and global food security would also be a critical element of risk reduction.

Having a healthier, better-educated citizenry depends on a strong research program in human nutritional needs and requirements. Providing an adequate supply of food that meets the individual nutritional requirements of a diverse population is essential to the security of the nation. Strong links to education are needed to ensure that research findings are available for citizens to act upon.

Options for protecting the natural resource base include: the development and transfer of new technologies and farming practices that reduce farming's impact on the environment for all farms and their surrounding ecosystems; research and development to recycle agricultural wastes of large-scale farmers; technologies and practices that reduce farmer dependence on purchased inputs, and efforts to better understand when and why farmers adopt technologies that are more profitable and environmentally beneficial.

Enhanced global competitiveness will be achieved by activities such as value-added processing, new uses of existing crops and animals, new crops, and commercialization of research that will create new jobs. A strong base program of research will allow the research system to respond quickly to economic, social, and environmental changes and support continued strength in production agriculture.

The Federal government's role in agricultural research is most clearly defined by the dilemma of "public goods" within a market economy. Activities, such as agricultural research, generate benefits to the public at large as well as to individuals. Private market incentives to invest in agricultural research are undercut when the resulting benefits are not captured at the individual, firm or State level. In addition, much of agricultural research requires long-term, and high-risk investments for example, the original development of genetic engineering. The private sector is further discouraged from investing in basic research because of the uncertainty of a profitable return on investment within a short-time period. The Federal government is the sole entity with the resources and ability to assure that there is an optimum level of investments in agricultural research to contribute to the economic and social strength of the nation.

The role of the Federal Government, as compared to State or local government, is to invest directly and to provide incentives for others to invest in those public goods that provide national or multi-state benefits. This includes research that will enhance agriculture's competitiveness in the global market and in turn, strengthen the U.S. economy. Research and development in human nutrition and food safety maintains a high standard of public health for Americans. New production methods and technologies work to sustain the nation's natural resource base upon which food and fiber production, as well as tourism and recreation industries depend. Data collection and analysis, where objectivity and elimination of duplication can best be done by government, is fundamental to the function of price discovery within the operation of free markets.

In relation to the land grant university system, the Federal Government has a role in supporting and coordinating universities as a national network of State-level research institutions. The Federal formula funds allocated to the land grant universities encourage a greater overall level of investment and multi-State collaboration in cases where a single State's investment incentive would be discouraged because of the "spillover" benefits to a neighboring State. For example, watershed pollution due to agricultural runoff in the Chesapeake Bay can only be solved if Pennsylvania, Maryland and Delaware act cooperatively. Federal formula funds and the coordination of national programs performed throughout a national network of land grant universities also creates efficiencies through the sharing of scientific skills, equipment, and knowledge base when addressing a common national problem within a variety of States. The diversity of research conducted across the State institutions provides a national ability to aggregate knowledge to avert or respond to national crisis or to take advantage of future opportunities.

The role of the Federal Government should change as knowledge and technology approaches the marketplace. The economic principle of "market failure" should be a guiding principle. Federal tax dollars should not substitute for private investment that would otherwise occur.

2. To what extent should goal setting and goals in agricultural research be cognizant of and coordinated with research activities in the rest of the Federal research sector (HHS, EPA, DOE, etc.)?

Research program managers, particularly those with strategic decision making authority, must be aware of the full scope of policy and research concerns with regard to health, environment, education, energy, defense and international relations, economic growth, employment and well-being. Many agencies regulate activities to support and protect agriculture and rural America. Research informs the regulatory process, and regulatory structures affect the development and adaptation of new technology. For example, the Department of Energy's (DOE) biomass for renewable energy program will directly affect agricultural land use, rural development, and agricultural policy. A 1991 Memorandum of Understanding (MOU) between DOE and USDA to cooperate on biofuels research resulted in this program. The MOU ensures that national biofuels programs do not inappropriately overlap, that the analysis coordinated, and that costs are shared when appropriate. On November 2, 1995, DOE and USDA entered into another MOU further recognizing technical cooperation between the two Departments on projects relating to control of cotton boll weevil pests, precision farming, food safety, ensuring product quality, aquaculture, and other projects relating to agriculture.

The benefits of coordinated research activities include effective use of resources; a heightened understanding of the research mission, perspective and opportunities for interaction; and the opportunity to avoid duplicative or conflicting courses of action. Currently, the Office of Science and Technology Policy (OSTP) and the National Science and Technology Council (NSTC) are playing strong roles to facilitate research coordination across the full Federal research and development sector. USDA participates in NSTC/OSTP policy setting for the Administration's science and technology goals, which helps focus USDA's research and education programs and avoid duplication.

The Environmental Protection Agency and USDA have successfully collaborated to find alternative methods for pest control for critical pest management needs as part of the USDA's Integrated Pest Management (IPM) initiative to achieve adoption of IPM on 75 percent of U.S. cropland by the year 2000. This coordinated effort to identify critical research and education needs will improve the economic profitability and environmental soundness of agricultural production.

3. Is the process associated with Food Animal Integrated Research for 1995 (FAIR '95) adequate for the development of Federal agricultural research goals? Are there goal identification processes which might better serve to enhance Federal agricultural research other than FAIR '95?

There is no single goal setting process that is appropriate for all research and education functions at USDA. The process associated with FAIR '95 is an excellent approach and one which should be, and is being, used to a greater extent in the identification and establishment of research priorities for agricultural research programs at the national level. However, the FAIR '95 process does not necessarily take into consideration all factors which must be considered in effective identification of goals for the agricultural research system. The FAIR '95 process emphasizes the role of agricultural research in meeting the needs of the industry served by the agricultural research community. It does not approach the research agenda from the perspective of USDA's action agencies or society's broader needs.

Another approach involving the scientific community and commodity interests has been successfully used by the State Agricultural Experiment Station System, through the Experiment Station Committee on Policy (ESCOP) of the National Association of State Universities and Land-Grant Colleges in the development of "A Strategic Agenda for The State Agricultural Experiment Stations" and by the Agricultural Research Service (ARS) in the development of "The Agricultural Research Service Program Plan." These processes focus more on the progression of science within specific areas of scientific discipline with less emphasis on overarching issues confronting the industry and consumers. Other types of priority setting, such as the advisory committee process for the National Research Initiative (NRI), translates more general research priorities as identified by a "FAIR '95" process into specific areas of basic research appropriate to the mission of the NRI.

It is important to remember that a significant portion of the total agricultural research system in the United States is neither operated nor funded by the Federal Government, but rather, operates in partnership with the Federal system. This partnership has been successful because both partners have a voice in setting the agenda and in setting priorities. The FAIR '95 process is an excellent mechanism to foster buy-in by the State partners into a national agenda, but represents only one step in a series to accomplish the establishment of a combined Federal/State research agenda. The Administration, in its 1995 Farm Bill Guidance calls for a long-term examination of publicly funded agricultural research facilities and the establishment of a ten-year strategic plan. This represents another example of an additional step needed in the priority setting process.

4. If the process of FAIR '95 were to be used to adopt an agenda for Federal agricultural research, how would the goals identified in FAIR '95 and listed below, need to be modified to address the concerns of all research stakeholders?

1) Enhance industry wide responsiveness to consumer and societal concerns;
2) Meet market demands through increased efficiency and competitiveness;
3) Develop integrated food animal management systems;
4) Maintain and enhance environmental quality;
5) Improve food quality control in terms of safety, desirability, and nutritional composition; and
6) Enhance animal well-being throughout the life cycle of food-producing animals.

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The goals identified by FAIR '95 apply specifically to the animal sector and are the result of a significant effort on the part of representatives of most aspects of the animal agriculture sector. However, the goals could be applied to interests other than animal agriculture. Modification of these goals to address the concerns of all research stakeholders could be accomplished by a process similar to that followed by the organizers of FAIR '95, if broadened to include representatives from all sectors of agriculture. While the six goals identified by FAIR '95 were intentionally broad areas intended to encompass the entire research community, the important new direction taken by FAIR '95 is in defining research goals in terms of solutions to major problems confronted by interested parties outside the research community.

The Administration believes that the major goals of national agricultural research should be increasing economic opportunity for rural people and farmers; having a healthier, better-educated citizenry; reducing risk for consumers and farmers; enhancing global competitiveness; and protecting the natural resource base for society. A major task for the research community is translating these goals into specific research projects and assessing the extent to which current research projects address these goals. Extending the Administration's or the FAIR '95 goals to all stakeholders in agricultural research requires a three-step process: First, a workshop, including the presentation of summary position papers which represent the views of consumers and other interested parties outside agriculture, the views of representatives of the users of agricultural research within agriculture, and the views of representatives of the agricultural research community, needs to be developed as a means to focus workshop participants on the potentially conflicting views of the issues confronting agriculture. The anticipated product is a compilation of major priorities for agricultural research like those of the Administration or FAIR '95. Second, ongoing research projects must be connected to the goals identified through an in-depth evaluation of the current research portfolio by the research community. The result will be an inventory of current research relative to the major goals identified and the development of a plan to redirect resources from lower priority tasks towards the higher priority goals with adequate resources. Finally, all of the priorities and current research activities need to be consistent with the requirements of the Government Performance and Results Act.

5. Is Federally funded agricultural research focused on the issues of highest priority for producers, processors, and consumers? If not, how can the priority setting mechanism be improved to insure that these issues are addressed?

To answer "yes" to the first question assumes the current priority setting process works perfectly and is in no need of evaluation or improvement. Instead, the questions warrant a brief review of the current priority setting process and suggestions for improvement.

Producers, processors and consumers often have competing interests that are expressed to the research communities as conflicting priorities. Policy makers are likely to hear that research priorities are not at all well-focused, depending upon the stakeholder's self-interest. As a result, the responsiveness of the Federal research agencies has been driven by the ability of groups to organize and gain access to the policy-making process. Political access among these three groups differs considerably.

There are a variety of ways that Federal research priorities are set, depending on the funding mechanisms and the purpose of the funds. There is a multitude of processes and interactions that influence what kind and how much research gets attention.

Within ARS, the majority of the budget reflects priorities developed by the National Program Staff that periodically develops a strategic plan. This plan involves input from industry organizations, farm organizations, commodity groups, scientific and professional societies, scientists within and outside of ARS, and other interested parties. ARS receives guidance from congressional testimony and bill report language. In addition, ARS serves as the research arm of the action agencies of USDA and holds priority-setting meetings with these agencies to determine their research needs. Over 100 national and regional stakeholder groups make annual visits to the ARS Administrator's and program managers' offices to discuss their needs and concerns.

The Cooperative State Research, Education and Extension Service (CSREES) has a more diffuse priority-setting process because of its partnership with the State Agricultural Experiment Stations and State Extension Services. The CSREES system of supporting local, State, and regional research locations through formula funds allows a "bottom up" or location specific approach to setting priorities. Each experiment station and extension service in the system has active advisory committees who serve to identify the needs of the State and region. At the same time, national strategic planning is carried out by the national CSREES staff, the National Association of State Universities and Land Grant Colleges (NASULGC) Experiment Station Committee on Organization and Policy, and the Joint Council on Food and Agricultural Sciences. The strength of the Federal-state partnership is that priorities can address issues critical to the nation as a whole, while providing specific State and local applications.

Priority setting for the National Research Initiative (NRI) Competitive Grants Program is shaped by the legislative authority that established the program. Emphasis is placed on research in the areas of natural resources and the environment; nutrition, food safety, and health; plants; animals; markets, trade and rural development; and processing for adding value or developing new products. Within these areas, national priority research needs are determined with input from science forums, user workshops (commodity groups, research societies, stakeholders), and other Federal agencies. The investigator initiated proposal submission approach used by the NRI ensures that scientists are pursuing research that is national in scope. The subsequent competitive selection process by peer review focuses on science quality and relevancy, and thus puts the panel recommendations in the framework of national priorities.

The CSREES Special Grant programs were funded at $63 million for FY 1995 of which $57.8 million is earmarked. While the earmarking of funds meets the priorities of constituents in specific congressional districts, the earmarking process dilutes USDA's ability to coordinate research activities and address national priorities. USDA supports a more coordinated approach reflecting national priorities.

One of the best opportunities to improve the priority setting process is the implementation of the 1993 Government Performance and Results Act (GPRA). The Research, Education and Economics (REE) mission area has recently begun implementation of GPRA with the development of strategic plans. A critical requirement of the GPRA strategic planning process involves obtaining customer input by each of REE's four agencies. ARS has conducted several "visioning" conferences with a variety of stakeholders throughout the country. The Agricultural Experiment Stations System and CSREES have held customer conferences leading to the development of a strategic agenda for Agricultural Experiment Stations. The Agricultural Experiment Stations and Cooperative Extension Services are planning a "futuring" conference that will address priority needs and expectations of customers. This will be completed by mid 1996.

GPRA provides the opportunity to seek customer input on research needs, but to develop an REE strategic plan to address those needs, and, ultimately to, hold REE accountable for accomplishments. Beginning with the FY 1998 budget request, goals, objectives, and outcome indicators will be published, thereby giving Congress an opportunity to base appropriations decisions on REE's progress and performance in defining and executing its strategic plan.

GPRA also requires REE to shift its priority setting process away from areas of research (plants, animals, soils, etc.) to focus on solving problems, or outcomes. Instead of budget decisions based on the units of inputs into single disciplines, resources will be allocated according to specific activities that will lead to solving particular problems. In its current strategic planning process, REE has identified 5 outcomes. They are:

1. Enhancing economic opportunity for rural people and farmers;
2. Having a healthier, better-educated citizenry;
3. Reducing risk for consumers and farmers;
4. Enhancing global competitiveness; and
5. Protecting the natural resource base for society.

At present, there are three different general research advisory committees: the Agricultural Science and Technology Review Board, the Joint Council on Food and Agricultural Sciences, and the National Agricultural Research and Extension Users Advisory Board. In recent years, funding has been reduced to the point where none of the committees can adequately fulfill its role. As part of the Administration's 1995 Farm Bill proposals, these three committees should be replaced with one National Research, Education, and Economics Advisory Committee. Within the national structure, four regional advisory subcommittees would also be established. The committee membership would be multi-disciplinary, representing the physical, biological and the social sciences. It would include representatives of commodity groups, general agricultural organizations, natural resource conservation groups, consumers and the land grant community.

The National Research, Education, Economics Advisory Committee would be charged with advising the USDA and land grant university partners on the research and education priorities within the five areas of enhancing economic opportunity; reducing risk; having a healthier, better educated citizenry, providing environmental benefits; and enhancing global competitiveness. The Committee would have a role in providing customer input for the REE strategic plan required by the GPRA. The Committee would also be involved in the Agriculture Research Facilities Study Commission by reviewing the decision-making criteria to be used by the Study Commission.

USDA's program and regulatory agencies rely on REE's research and analysis for the design and delivery of programs and services to producers, processors and consumers. To better serve the needs of REE's internal customers, the Administration proposes the creation of a Research, Education and Economics Policy Council to create an improved link between REE's research and education functions and the Department's program and regulatory agencies. The REE Policy Council would be established within the Office of the Under Secretary for REE and would be comprised of the agency administrators of ARS, the Economic Research Service (ERS), CSREES, and the National Agricultural Statistics Service (NASS), along with the Under and Assistant Secretaries of USDA. The Under Secretary for REE would chair the council.

The council would provide a forum for better communication about the availability and capabilities of REE research, education, and economics activities. The council would establish priorities to ensure coordination of efforts in carrying out USDA's programs and activities that are dependent on the research, education, and economics functions of the mission area.

Finally, national research priorities could be better served by replacing the earmarking process of Special Grants with a competitively awarded grant program for applied research at land grant universities and their experiment stations. A competitive grant program could also include a 50 percent match requirement that would further ensure that national research priorities are addressed at the State level.

6. Should Federally funded agricultural research address specific technological and industrial needs? If yes, does the present system fulfill this goal (if not, please describe how this can best be accomplished)?

Yes. Federally funded research should address specific technological and industrial needs, but only when there is a compelling national and public interest. World class leadership in technology begins with a preeminent capability in basic and fundamental research. This puts our nation in a high state of preparedness for any emergent issue or crisis while laying a foundation of scientific knowledge to draw from in the years to come. To fully capitalize on technology intelligence, partnerships with business and industry are necessary where science is translated into economic action and employment. For specific technological and industrial needs, the Federal research capability is a valuable resource to help shorten the time frame for adoption of a problem-solving technology. However, public support should produce clear public benefits. If private interests are primarily served, the research should be financed by private sources and conducted in private facilities.

7. Does Federal agricultural research adequately address projects that result in quantum leaps in benefits, or does it dwell too much on incremental benefits?

Almost all research by nature produces incremental benefits. The incremental benefits in aggregate can result in quantum leaps in benefits as a result of relatively high-risk, long-term research. The continuing investment in research has produced significant advances when measured over years. However, additional funding for high-risk, long-term efforts, like the kind of research undertaken by ARS, could increase overall returns on research investments by reducing the time required to address specific, critical problems.

8. What is the appropriate role for USDA/REE in insuring competitiveness in the face of decreases in price support programs?

A reduction in the levels of income and price support programs, combined with greater planting flexibility, could place U.S. producers, their input suppliers and the industries they supply in a state of change and uncertainty. Market signals and conditions would play a significantly more important role in farm level decisions (production practices, inputs, and technology, and the storage, handling and marketing of products) that might affect the geographic location or production and the economic and social health of rural communities. Price support programs have provided a mechanism to manage the risk of extreme price swings, and variable weather patterns and production levels. As the "safety net" for farmers is diminished, alternative tools for risk management will become more critical.

To maintain long-term competitiveness, it will be critically important to support public investments in research. However, there is often a lag time between most research initiatives and their benefits to individual producers.

In the short-term, the most appropriate role for USDA-REE would be to immediately provide aggressive Extension support, in collaboration with the tools and resources from agencies throughout the Department, to develop targeted assistance to producers who will be facing significant reductions in farm income as a result of cuts to commodity price support programs. Producers will need alternative strategies for production, marketing and risk management that guard against the vulnerabilities and maximize the opportunities of change.

REE will assure 1) that Departmental and cooperator basic and applied research in the physical, biological and social sciences is properly prioritized to expand the knowledge and information base relative to the needs of constituents, and 2) that higher education and extension programming are focused to expand and enhance the decision making and entrepreneurial capacity of farmers and rural people. A more fully integrated research, extension and education response will help producers to manage change by choosing the best mix of enterprises and

organizational methods to optimize their personal and economic goals.
In addition, the increased importance of market signals in this new environment will make the provision of credible, timely and accurate data and information on current and prospective production levels and other market influencing factors even more critical. Agricultural statistics and economic indicators provided by NASS and ERS will be vital to the smooth functioning of agricultural markets and to producer decision-making in a more market-oriented farm policy environment.

9. How can the appropriate Federal-State-Industry resource pools be integrated to develop high priority regional programs in research, teaching and extension?

Federal, State and industry resources can be successfully integrated when the parties involved have issues of mutual concern and the benefits of collaboration outweigh the benefits of any one entity's proceeding on their own. Since each of these entities has access to different resources and each has a different self-interest, integration of efforts among the three entities succeeds when their mutual interests are served. ARS and CSREES are concerned with public issues of national importance. While the land grant universities receive some of their funding through the Federal formula funds administered by CSREES, the State Extension Service and Experiment Station organizations make their own determination about how resources will be allocated according to the needs of their respective States and local communities. Because of its profit orientation, the private sector is more likely to engage in short-term investments and to be concerned about proprietary use of information.

This Administration sees great potential for regional coordination. However, to make regional coordination fully effective, it must be based on a shared strategic plan. The proposed Agriculture Research Facilities Study Commission is designed to produce this plan. Regional coordination of research, teaching and extension programs creates economies of scale, particularly in an era of declining or flat budgets for State and Federal programs. Fundamental to this regionalization concept is the notion that not all institutions (Federal, State, or private industry) need to have research programs in all specialties or problem areas. The general research infrastructure, expertise and equipment needed to support state of the art research is expensive. Regional "Centers of Excellence" specializing in high priority issues relevant to the region and sharing research methods and results among regions would not only be less costly to taxpayers but more effective since critical expertise and research capital could be concentrated on high priority issues.

Regional coordination of programs also makes sense from the perspective of designing programs to focus on outcomes and problems rather than inputs and activities. Agricultural, environmental and human nutrition problems are not generally confined to State boundaries but tend to be defined by geography, climate, soil types, demography, ethnicity, income levels or a variety of other factors.

Current examples of this type of integration that might serve as models for further integration of efforts among the Federal and State governments and the private sector are:

- The Integrated Pest Management Initiative that redirects and combines USDA-ARS and land grant university research and extension programs into a single coordinated and cooperative effort to address important pest problems in partnership with producers. The initiative coordinates efforts of EPA, CSREES, ARS, ERS, NASS, and land-grant universities through a subcommittee chaired by a Federal IPM coordinator. Each state has an IPM coordinator and a team composed of representatives of producers, private sector, research, extension and Certified Crop Advisers.

- The Midwest Water Quality Initiative brings together State Experiment Station scientists (with funding from CSREES), Extension specialists, U.S. Geological Survey and EPA scientists, and ARS scientists to develop and manage the long-term Management System Evaluation Area projects in five States. Producers have been involved in designing and field testing alternative farming systems.

- A project to develop management methods to produce Salmonella free pork that involves Iowa State University (with funding from CSREES), ARS-National Animal Disease Control scientists, USDA-APHIS, the National Pork Producers Council, and private pork producers who have agreed to be cooperators in this project.

To create an integrated research and extension approach, as these cases illustrate, the issue needs to be one that producers and their associations and the State and Federal agencies all agree is of high priority and worthy of a concerted effort. Involvement of producers at an early stage to identify their needs and confirm their support is very important. A land grant university may need to play a central role since it can receive funds from a variety of sources, including Government and private sector.

An incentive approach rather than a rigid, hierarchical mechanism or organizational structure is generally the best approach when fostering integration efforts. Flexibility and creativity can be encouraged, but not mandated. One possibility is to award seed money or "challenge grants" based on the level of collaboration with affected stakeholders. Scientists should be encouraged to pursue more partnering an expectation that should be reinforced through their personnel performance reviews.

Strategic planning, currently underway within the Federal government agencies in fulfillment of the GPRA, provides an opportunity for developing an understanding of the core missions of each agency. The process involves assessing customer input, including private industry, for development of the plans. This is currently being accomplished with ARS through a series of Visioning Conferences. It is expected that through this process, the core competencies of the Federal Government agencies will be identified in relation to the needs of its customers and the interests and resources of its stakeholders. Based on this understanding, the REE strategic plan should identify those issues of highest priority on a national and regional basis and those stakeholders that are most likely to join in partnership to solve problems in collaboration.

10. How important is the Federal agricultural research role in supporting other agencies of USDA? Other Federal agencies? Could this be done more efficiently and at a lower cost?

Support of the research needs of other agencies of USDA is a primary role of the Federal agricultural research capability. Examples include food safety diagnostics and preventive technologies for the Food Safety and Inspection Service (FSIS), erosion prediction capabilities for the Natural Resources Conservation Service (NRCS), and understanding diet-health relationships for the Food, Nutrition and Consumer Services (FNCS) mission area. Agricultural research support for non-USDA Federal agencies, such as development of pesticide alternatives and assessment of biotechnology risks for the Environmental Protection Agency (EPA), is also very important and should be conducted in collaboration on issues of concern to both agencies.

REE is already striving to provide research support for other Federal agencies efficiently. However, lower total spending for research support may not be possible because of the need for increasing investment in this area as Federal action and regulatory agencies become increasingly reliant on science and technology as a basis for policy formulation and program implementation.

Greater efficiency in meeting the needs of other Federal agencies requires a clear statement of the problem to be solved and a close working relationship between the research and action agencies. Within USDA, the proposed new REE Policy Council will bring together all mission areas for the purpose of identifying such research needs and interactive activities. Also critical to achieving improved efficiency are resources such as expert multidisciplinary scientists who can address highly diverse issues and resource flexibility for extramural acquisition of knowledge and technologies not available within the research agency.

11. USDA reorganization created the Cooperative State Research, Education, and Extension Service (CSREES). In your opinion, how should this newly configured agency function to support the U.S. agricultural enterprise, 1995-2002?

USDA reorganization consolidated the Cooperative State Research Service with the Cooperative Extension Service. The newly formed Cooperative State Research, Education and Extension Service (CSREES) creates an opportunity to develop programs where research and extension jointly deliver scientific information and knowledge to farmers, consumers and communities in a more streamlined and effective way.

By linking the two functions of research and extension education together, the agricultural enterprise of the future will be better served through more efficient and integrated technology transfer. Extension outreach to producers creates a link to inform researchers of the needs and problems of the agricultural enterprise and to deliver the technologies and information developed by the research arm of the land grant universities.

CSREES is a Federal partner of the land grant university network and manager of competitive research grant programs open to all researchers and institutions. Through this role as a national coordinator it links expertise found in other fields (biology, social sciences, engineering) that are applicable to the agricultural enterprise. At the same time, CSREES serves to facilitate agriculture's contribution to other fields (energy, medicine, etc.).

12. What is the proper place for integrated systems programs? What role should the Extension Service (extension functions within CSREES) play in these programs?

Integrated systems programs are the cornerstone to sound, profitable and usable animal and crop management technologies. An integrated approach to animal and crop production should yield better economic return and enhance environmental benefits. The Extension Service should provide educational programs on integrated agriculture and natural resource management. Examples of programs that include an integrated systems approach are the Water Quality Initiative, IPM programs and the Sustainable Agriculture Research and Education program. Integrated farming systems will allow producers to manage for improved net farm income, pest control with minimal environmental impact, and an improved quality of life.

13. Have USDA's research and extension advisory and coordinating boards been effective in planning and prioritizing agricultural research and extension? (Please explain)

At present, there are three different general research advisory committees: the Agricultural Science and Technology Review Board, the Joint Council on Food and Agricultural Sciences, and the National Agricultural Research and Extension Users Advisory Board. In recent years, funding has been reduced to the point where none of the committees can adequately fulfill its role. As part of the Administration's 1995 Farm Bill proposals, there is a recommendation that these three committees should be replaced with one National Research, Education, and Economics Advisory Committee. Within the national structure, four regional advisory subcommittees would also be established. The committee membership would be multi-disciplinary, representing the physical, biological and social sciences. It would include representatives of commodity groups, general agricultural organizations, natural resource conservation groups, consumers and the land grant community.

The National Research, Education, and Economics Advisory Committee would be charged with advising the USDA and land grant university partners on the research and education priorities within the five areas of enhancing economic opportunity; reducing risk; having a healthier, better educated citizenry; providing environmental benefits; and enhancing global competitiveness. The committee would have a role in providing customer input for the REE strategic plan required by the GPRA. The committee would also be involved in the Agriculture Research Facilities Study Commission by reviewing and approving the decision-making criteria to be used by the Study Commission.

14. How have research or extension priorities been changed as a result of the recommendations of advisory boards (please provide examples)? Are there presently too many advisory boards?

Recognizing that many other sources provide external input to the Department on research and extension needs, advisory boards have played an important role in helping to validate and support increased emphasis on some areas of research, such as sustainable agriculture, food safety, biotechnology, human nutrition, genetic resources, and others. Research priorities within the REE agencies are under review on an ongoing basis and priorities are frequently altered in response to recommendations from various stakeholders, customers, and partners. The advisory boards play a role in the research priority review process.

Both the Joint Council for Food and Agricultural Sciences (JC) and the National Agricultural Research and Extension Users Advisory Board (UAB) have demonstrated the ability to serve as early warning signals for future challenges. For example, major research and extension efforts are underway to decrease pesticide residues and contamination in groundwater by agricultural chemicals. Reports issued in the late 1970's and early 1980's by the JC and the UAB identified these food safety and environmental concerns as areas worthy of increased research and extension activities. In the mid 1980's, these boards listed the assessment of microbiological risks due to microbial and chemical residues in agricultural products as the number one priority for food scientists—this is currently a major research thrust at USDA. In the early 1990's the UAB recommended that USDA's Science and Education agencies institute a formal and rigorous program of Total Quality Management—the recent USDA reorganization and the current REE strategic planning exercises incorporate many of the UAB recommendations. The Agriculture Science and Technology Review Board's (ASTRB) recommendations on the need to strengthen USDA's technology assessment capability, particularly with respect to sustainable agriculture systems, played an important role in increasing the REE research activity in sustainable agriculture systems. ASTRB has developed a technology assessment protocol pilot that will be tested soon.

The Department believes that more advisory boards exist than are needed and can be adequately supported with available resources. Accordingly, the Department recommends the consolidation of the three existing boards, the JC, the UAB, and the ASTRB, into a new proposed board to be called the National Research, Education and Economic Advisory Committee. The three existing boards are similar with respect to the broad priorities (sustainability, competitiveness, safe and nutritious food supply, etc.), although specific project priorities often differ because of the particular make-up of the boards. It is the goal of the Department to streamline the advisory board process by creating the National Research, Education and Economics Advisory Committee.

15. What options should Congress consider to improve USDA's process for planning and prioritizing agricultural research? (i.e. how should the research agenda be prioritized?)

There are several options that Congress should consider in an effort to improve USDA's process for planning and prioritizing agricultural research.

Congressional oversight of the GPRA would assist in planning and prioritizing research. GPRA is a process created by Congress that has the potential to be a constructive, methodological means to setting research priorities and ensuring that the intended outcome of the research is completed to address the priorities. The GPRA is based on strategic planning at the Department, mission area and agency levels. These strategic plans are to identify outcomes or intended results, along with the goals and activities that best serve the stated outcomes and provide the basis for budget proposals. The strategic plan also identifies performance indicators and measures that are to be used to determine if goals and outcomes were achieved. Using the components of the strategic plans, Congress might be better informed when addressing budget requests and better equipped to evaluate programs on the basis of how well the goals and outcomes are achieved. The REE Mission Area and each of the four agencies are currently developing strategic plans to be completed for use in the FY 1998 budget requests. Because priorities are ultimately established by the Congressional appropriations process, a GPRA strategic plan aligned with the budget request will provide Congress with better information to make appropriations decisions.

In the 1995 Farm Bill Guidance of the Administration, a proposal is outlined to shift from broad categories of research (i.e., plant sciences, animal sciences, etc.) to desired outcomes. This shift should greatly improve the ability of REE to conduct meaningful planning and prioritizing of research and education by focusing REE's work on problems to be solved and opportunities to be created.

The REE Mission Area currently has three general advisory boards, but limited funding over the last several years has inhibited the advisory boards from fulfilling their mandated roles. The Administration's 1995 Farm Bill Guidance calls for the replacement of the Agricultural Science and Technology Review Board, the Joint Council on Food and Agricultural Sciences, and the National Agricultural Research and Extension Users Advisory Board with one National Research, Education and Economics Advisory Committee. Within the national structure, four regional advisory subcommittees would also be established. The committee membership would be multidisciplinary, representing the physical, biological, and social sciences. It would include representatives of commodity groups, general agricultural organizations, natural resource conservation groups, consumers and the land grant community. The advisory committee would be charged with advising the USDA and land grant university partners on the research and education priorities within the five outcomes of enhancing economic opportunity; reducing risk; having a healthier better, educated citizenry; providing environmental benefits, and enhancing global competitiveness.

In addition to giving attention to GPRA and to authorizing a National Research, Education and Economics Advisory Committee, planning and prioritizing agricultural research could be enhanced by multi-year funding and the elimination of earmarked special grants. Multi-year funding, at least for a segment of the research budget, would permit longer term planning and more sustained research efforts, with greater coordination and less unproductive time devoted to application and review of grants.

16. What role should stakeholder advisory boards play in setting the agenda? What groupings should be represented on advisory boards? Can "customers" and "partners" be accommodated on one board or will it require two?

Membership on the advisory board should represent the full range of food and fiber stakeholders including multidisciplinary, physical, biological and social scientists; members of commodity groups; general agricultural organizations; natural resource conservation groups; consumers; and the land grant community. Both customers and partners should be represented on each board in order to establish the essential interaction, education, and understanding among the various members and their interests in providing input to the USDA research, education and extension agenda.

17. Is there a special role for advisory boards to play in international agriculture beyond what has occurred in the past?

More than 95 percent of the world's population resides outside the United States and more than 70 percent of agricultural research takes place outside the United States. Obviously, there are research findings and market opportunities of vital interest to the United States that lay beyond its borders. Currently, most advisory or coordinating activities focus on U.S. technology transfer to foreign countries and on various bilateral cooperative science programs. Increased attention should be given to emerging market opportunities, particularly for U.S. value-added products, and for collaborative research that focuses on joint technology development where the outcome is of mutual benefit. Research is also critical to insuring that trade restrictions are based on high quality science. Advisory boards could assist the United States in these areas by pooling special knowledge of foreign countries, their cultures, institutions, and commercial opportunities.

The proposed National Agricultural Research, Education, and Economics Advisory Committee could include attention to international issues, challenges, and opportunities. Such a board could elect to establish a sub-committee or task force to focus on the international dimension. The information and proposals could then come before the full committee and be considered and incorporated into a unified advisory and planning vision.

18. What is the most appropriate mix of Federally funded basic and applied agricultural research?

All USDA research should be focused on developing solutions to agricultural and related problems. To solve these problems, a continuum of basic and applied research is needed. Neither is more or less important than the other. Both basic and applied research are essential to success and they are interdependent and mutually supportive. Applied research depends on a basic knowledge foundation and, in turn, generally raises questions that require fundamental studies of underlying principles. For USDA, it is essential that funding for both basic and applied research be continued and to let the managers and performers of research help determine the research approach necessary to solve current and future agricultural problems. USDA research agencies and partners must maintain core capabilities, multidisciplinary teams, modern facilities, and updated scientific equipment to be able to respond to the research challenges of the future. This requires both applied and basic work.

19. How, if at all, can effectiveness and efficiency of agricultural research be enhanced at current funding levels? At reduced funding levels?

At either current or reduced funding levels, the efficiency of agricultural research could be enhanced by consolidation of multi-location programs to increase the critical mass of scientific talent, multidisciplinary teams, and scientific equipment. This would result in fewer research locations, reducing the infrastructure and administrative costs of operating numerous facilities associated with similar program areas. Consolidations could result in improved coordination among traditional Federal, State, and industrial partners in planning and conducting agricultural research. REE should develop partnerships with other agencies, institutions, foundations, private sector and nonprofit entities beyond traditional groups to enhance the utilization and effectiveness of the public investments in research. Priority setting mechanisms among research performers, customers, and stakeholders need to be improved to ensure that available research resources are targeted to the most relevant and meritorious programs for public benefit. Implementation of the GPRA, with the development of strategic plans, performance goals and measures, will provide better information for making funding decisions based on priority needs and performance of publicly funded research to target limited and/or reduced funding levels.

20. How can future funding be determined and justified so as to permit multi-year programs to be completed?

By its very nature, agricultural research to solve problems and to improve the efficiency of agricultural systems requires long-term efforts and sustained resource support. To properly determine and justify funding for such multi-year programs to be carried out by USDA research agencies and partner institutions, several important ingredients are required.

First, an overall research agenda or strategic plan is needed for USDA. Such a plan must reflect and respond to a broad base of customer and stakeholder input on research needs and priorities. The GPRA process to develop a strategic plan is already underway. Second, clear roles and complementary responsibilities of the USDA and partner research performers must be established. Third, complementary roles should be established for the different funding mechanisms--in-house, formula, and competitive. Fourth, program evaluation must include both prospective and retrospective reviews based on merit and relevance. Fifth, sound reporting and technology transfer mechanisms must be put in place. These ingredients form the basis for a continuous, interactive planning, coordination, and evaluation system that builds and maintains credibility among the public supporters and benefactors of USDA research programs and warrants the expenditure of public funds.

21. In view of the growing emphasis on greater accountability of Federal expenditures, do you have any suggestions as to how agricultural research results can be measured and their impact evaluated? Is there some standard of accountability for the efficient and effective use of Federal research funds?

The GPRA creates the most comprehensive approach for the accountability of Federal taxpayer dollars. It requires Federal agencies to respond to the fundamental questions Congress asks in the Act: 1) "What are you going to do?" 2) "How are you going to do it?" and 3) "How will you know when you have achieved what you said you were going to do?" To answer these questions, GPRA requires a strategic plan including the identification of outcomes, performance goals and performance measures. The strategic plan will then inform budget-making decisions. A performance plan will report the progress on achieving the goals and outcomes according to the performance measures and indicators.

USDA-REE and its four agencies began the strategic planning process in the fall of 1994. The plan outlines five outcomes of USDA's research, extension, economics, statistics and education programs:

1. Enhanced economic opportunity for rural people and farmers;
2. A healthier, better-educated citizenry;
3. Reduced risk for consumers and farmers;
4. Enhanced global competitiveness; and
5. Protection of natural resources and the environment.

The outcomes are problem-focused and customer-oriented. Ultimately, each program or research project will be measured according to its contribution to one or more of the five outcomes. The next steps in REE's strategic planning process will be the development of goals by each agency as to how it will contribute to the achievement of these outcomes. The goals will determine which program activities USDA-REE will undertake. Each activity must be accompanied by performance indicators to measure how well the activity achieves the performance goals. The standards of accountability under the GPRA are the benchmarks set by the performance goals and the progress made annually to achieve those benchmarks.

Given the nature of scientific research, GPRA presents several challenges. First, some research efforts take many years before they yield results that are apparent as measurable impacts. Second, outcomes can be attributed to the interaction of a variety of factors. As a result, performance measures have to be carefully designed to be able to isolate the effective contribution of REE's activities to achievement of our stated outcomes. However, outcome-directed research will begin to set the standard for post-ante evaluation of the relevancy of an activity before it is undertaken.

Measuring the contribution of basic research to achievement of the five outcomes presents a special challenge. Basic research provides the foundation to achieve applied or problem-oriented research, and intermediate outcomes need to be established to measure the impacts of basic research.

Many analysts of agricultural research investments point to the internal rate of return (IRR), an economic indicator used by private firms as a way to make investment decisions. Using this measure of performance, public investments in agricultural research have been estimated to yield an IRR of at least 35 percent. At first glance, this IRR would imply that the private sector should be investing in agricultural research. However, this private sector measure is not an adequate descriptor of the nature of public goods and the nonproprietary nature of agricultural research. Therefore, more qualitative indicators are needed to measure the social benefits of agricultural research.

The GPRA is an unprecedented approach to accountability of taxpayer funds. GPRA holds the potential to more fully assess the impact of Federal investments in agricultural research where current standards of accountability fall short. In the past, we have measured "outputs" such as peer-reviewed publications, but they do not truly describe the impact of the research on solving a particular problem or creating new economic activity. The process of awarding competitive grants according to merit is a process focused on quality of the "inputs" of a research activity instead of the intended results or outcomes that will be achieved by focusing on the outcomes of the proposed research.

22. What is the proper balance between in-house, formula funds, competitive grants, and special grants?

The current funding for in-house, formula, competitive grants, and special grant research funding in USDA is approximately $714 million, $226 million, $100 million, and $63.3 million, respectively. This allocation has provided stable in-house and formula funding for core research programs requiring long-term, sustained funding while providing competitive and special grant funding to respond to shorter-term research needs and areas of scientific opportunity. An additional $298 million is provided through Extension Service formula funding.

In-house research addresses critical national issues that require long-term commitments, specialized facilities, and supports the research needs of the action agencies of USDA. This research should be focused by the needs identified by the agencies' strategic plans and help provide the science base for important policy decision making.

Formula funds support the research infrastructure in the State Agricultural Experiment Stations, which conduct long-term research such as plant and animal breeding, crop rotation, and other studies that cannot be completed in the finite duration of most grants. The Experiment Stations also support applied and adaptive studies that are not fundable through grant programs.

The competitive grants part of Federal funding for agricultural research includes Special Grant national competitive programs such as Water Quality, the National Research Initiative, the Small Business Innovative Research, and Biotechnology Risk Assessment programs. While competitive programs represent the second largest portion of Federal research funds going to the States, the NRI funding should be increased to meet its authorized level of funding at $500 million. Competitively funded projects provide the resources to make the most effective use of the research capacity provided by formula and state funding and allow those scientists to study basic principles needed to support their adaptive and applied research. The combination of these two sources makes it possible to have a strong mission oriented research effort in which the basic and applied components are mutually supportive.

Special Grants play an important role in support of agricultural research conducted by the land-grant universities. The importance of this funding mechanism is the ability to focus resources on a specific problem and to bring about regional or national coordination and leveraging of other sources into the effort. A small number of national or regional grants, such as water quality, IPM, minor use pesticide and animal drug clearance are competitively awarded. Thus, they provide the science quality of a competitive selection process with a high degree of focus and coordination. Many of the Special Research Grants, however, are noncompetitive, earmarked grants and do not address national priorities. The 1995 Farm Bill Guidance of the Administration recommends the elimination of earmarks and, instead, recommends competitive awards for all Special Grants.

Agriculture's problems are local, regional and national. Some of the site-specific research requires investment in sites and facilities across the country. Other local and regional needs have historically been met by major investments through the Federal-State partnership. Many national needs can be met by research which does not require a specific locale.

The research portfolio for agriculture, with the four funding mechanisms, has evolved over time in order to approach agriculture's problems at all levels. None of the four mechanisms operate in isolation. Rather, the four almost always coordinate, cooperate and leverage funds among the scientists and institutions involved. Further, and very importantly, agriculture's needs change--new problems emerge, institutions evolve, national priorities change--and the system needs both the flexibility and the stability provided by the four funding mechanisms.

23. What guidelines should be used in determining appropriations for "specific programs" in research, education, and extension?

Guidelines for appropriations for specific programs should include: consistency with a Federal role or support, broad public interest, peer review for program relevance and scientific merit and congruence with customer needs. More specifically, they should meet the following criteria:

1. Does it contribute to achieving one or more of the five REE outcomes of enhanced economic opportunity for rural people and farmers; a healthier, better-educated citizenry; reduced risk for consumers and farmers, enhanced global competitiveness; and protection of the natural resource base for society?
2. Is the problem of national or regional importance and, if solved, would it yield significant benefits?
3. Is the current scientific knowledge available to adequately prevent or solve the problem? If the information is available, then an extension program could be implemented. If not available, then research would be needed.
4. Is the status of the problem such that accomplishments may be anticipated through the application of research and education (including extension) to such problem?
5. Does the proposal meet high standards of education and research with respect to methodologies to be used, the design of the experiments, programs and the methods of data analysis to be used?

Use of "specified program" criteria to determine appropriations for emergency or crisis issues is probably not the best approach for addressing such problems. A more effective approach would be to allow USDA the flexibility to allocate Departmental funds as deemed necessary by the Secretary for response to emergencies, crises or emerging issues as they arise.

24. Should Federal funds be used for programs only, or for facilities as well? If for facilities, how should they be allotted - competitive or other? Is there a place for regionalizing research, increasing competitive grants, etc.?

Federal funds should continue to be used for both programs and facilities. In the case of in-house USDA programs, Federal funding should be the primary source of support. In the case of partner programs, some form of shared funding is appropriate. In cases where facilities house basic and other laboratory oriented research that is non-site-specific, competitive funding for such facilities and their programs is appropriate.

The 1995 Farm Bill Guidance of the Administration proposes a competitive grant program for university research facilities to replace the current earmark process and ensure greater equity and relevance of federally supported research at land grant universities. Criteria for grant awards could reflect national research priorities in the areas of enhancing economic opportunity; reducing risk; having a healthier, better-educated citizenry; providing environmental benefits; and enhancing global competitiveness. This authorization would replace USDA's current facility construction authority. The 10-year strategic plan developed by the proposed Agriculture Research Facilities Study Commission would give guidance to decision making about future facility construction.

The regionalization of research programs is a valid approach that has proved successful and deserves continuing support. The regionalization of specialized partner facilities in such program areas as veterinary and forestry sciences has also worked well. This facility concept could be extended to other important research program areas as well.

25. Is there a place for partnerships not only with state and local public sector organizations and industry, but also with private foundations?

Yes, there is a place for all such partnerships. Many examples of these partnerships exist, particularly among the Federal, State, and/or industry sectors. Private foundations, as well as nonprofit research organizations, are playing an increasing role in broadening the perspective of USDA research programs by providing viewpoints of stakeholders not directly involved in agricultural production. Foundations and nonprofit research organizations such as the Rodale Institute, Leopold Center, American Farmland Trust, Kellogg Foundation, Northwest Area Foundation, the Farm Foundation, Henry A. Wallace Institute for Alternative Agriculture, C. V. Riley Foundation, and others provide a broadening perspective to define problems and formulate a balanced research and extension approach. These partners participate in program planning and educational outreach activities that increase acceptance and support for the agricultural producer. Considering the views of stakeholders not involved in the agricultural research program planning process has become increasingly important as farmers adjust to the changing demographics and environmental and social impacts that must be considered when choosing production practices.

26. To what extent do self-assessed "check-off" fees on commodities provide resources for research and education? Do these/should these programs support long-term research as opposed to short-term product development and promotion research?

"Check-off" fees collected by Research and Promotion Boards have served an important role in supplementing publicly funded core research programs. A review of the schedule of revenues and uses of funds for commodity research and promotion boards for the fiscal year ended in 1992 (most current data), shows that nearly 15 percent of the total Board revenue of about $254 million was allocated to research. Most of this $38 million research dollars sponsored research on dairy, cotton, soybeans, beef and pork. Promotional activities accounted for almost 65 percent of the total revenue. The general purpose of Promotion

Boards is to expand the market for their commodities, thereby improving the market position of their respective producers. The boards which manage their respective commodity research and promotion programs must acknowledge two constraints: 1) as a self-help program, producer approval is required for program sustenance; and 2) activities pursued by R&P's must enhance the marketability of the commodity to achieve the overarching policy and strategy objectives of each R&P.

In the future, "check-off" research programs might play an increasingly important role in funding research that directly benefits their industry. Generally use of commodity funds as determined by the Boards have supported short-term research projects that address immediate problems and research needs of the commodity industry. One example would be research on pest control technologies.

However, among some Research Promotion Boards, there has been a trend toward support of longer-term investments in basic research, such as genome mapping and other molecular biology research approaches. For example, the United Soybean Board is actively promoting and supporting research efforts to explore the use of soy proteins in health applications to reduce heart disease and bone ossification, with potential promise in cancer research. The Beef Board is supporting research to measure value-based characteristics of cattle. Support for long-term research is a positive trend and should be encouraged.

27. In order of priority, what would be the most significant actions USDA could take to improve its management and/or delivery of agricultural research?

There are nine actions that USDA has initiated administratively and proposed as legislation for the improvement of USDA's management and delivery of agricultural research. They are listed below in order of priority.

Increase interagency cooperation and multi-disciplinary research approaches: USDA reorganization brought the full spectrum of biological, physical and social sciences together under one mission area. Cooperative contributions from each of the four REE agencies can more effectively address complex problems such as water quality, pest management and integrated farming systems requiring multidisciplinary approaches. REE's strategic planning efforts are seeking to identify opportunities for greater multi-disciplinary and multi-agency cooperation.

Implementation of the Government Performance and Results Act: REE and its four agencies are currently developing a strategic plan including the identification of five outcomes from which all agricultural research, education and extension activities will be planned, budgeted and evaluated according to their progress on achieving the five outcomes. (see question 21)

Agriculture Research Facilities Study Commission: The 1990 Farm Bill authorized the creation of a commission to review all currently operating and planned agricultural research facilities. The commission has not received appropriations and therefore, has never been activated. The Administration's 1995 Farm Bill Guidance proposes the reauthorization of an Agriculture Research Facilities Study Commission charged with reviewing existing and proposed federally funded research facilities; identifying those that should be closed, realigned, consolidated, or modernized; and making recommendations to Congress. The study would result in a 10-year strategic plan for utilization, development, construction, consolidation, and closure of Federal facilities based on a national and regional analytical perspective. Membership on the Commission would include 25 private-sector members with representation from farm commodity groups, general farm organizations, agricultural scientists associations and conservation organizations.

REE Policy Council: As part of the Administration's 1995 Farm Bill Guidance, we propose the creation of a Research, Education and Economics Policy Council to improve the link between REE's research and education functions and USDA's program and regulatory agencies. The REE Policy Council would be established within the Office of the Under Secretary for REE and would be comprised of the Deputy Under Secretary, agency administrators of ARS, ERS, CSREES, and NASS, along with the Under and Assistant Secretaries of USDA. The Under Secretary for REE would chair the council. The council would provide a forum for better communication about the availability and capabilities of REE research, education, and economics activities. The council would assist the Under Secretary in establishing priorities to ensure coordination of efforts in carrying out USDA's programs and activities that are dependent on the research, education, and economics functions of the mission area.

National Research, Education and Economics Advisory Committee: The Administration proposed that the 1995 Farm Bill authorize the replacement of the Agricultural Science and Technology Review Board, the Joint Council on Food and Agricultural Sciences, and the National Agricultural Research and Extension Users Advisory Board with a National Research, Education and Economics Advisory Committee. In recent years, funding has been reduced to the point where none of the committees can adequately fulfill its role. Within the national structure, four regional advisory subcommittees would also be established. The committee membership would be multi-disciplinary, representing the physical, biological and the social sciences. It would include representatives of commodity groups, general agricultural organizations, natural resource conservation groups, consumers and the land grant community.

Extension Working Group: The Under Secretary for REE has created a six-month working group to examine the future role of the Cooperative Extension Service. The 16 member body, chaired by Deputy Under Secretary Floyd Horn, is to examine and make recommendations on the vision of the future of Extension; the roles of the Federal, State, and local governments in the financing and accountability of Extension; ways to ensure relevancy of Extension to serving customer needs; and identification of alternative or additional models for program delivery. The recommendations will strengthen the Cooperative Extension partnership and will be given consideration in the agency's strategic planning process.

Quality Assurance: We are currently in a climate where there is skepticism about the quality and relevancy of USDA research programs. The Under Secretary for REE has recently established an interagency task force to examine ways to improve the quality and standards of our work; review the current system of peer review and develop a widely recognized process for quality assurance; and develop outcome-based measurements to aid in determining the future direction of research at REE.

Greater use of information technology: The developments in information technology create greater opportunities for efficient and low-cost delivery of REE's research findings, statistical reports and economic analysis. We are increasing the use of electronic publications and expect continued expansion. REE is looking for ways to make greater use of information technology to obtain customer input and feedback as a way to improve the relevancy of our research activities.

Reinvent the CRIS: The Current Research Information System (CRIS) is currently undergoing a review to improve REE's capability for tracking and evaluating current research and extension activities, including the electronic entry, accessibility and usefulness of the data.

28. What options should Congress consider to improve the delivery, results, and benefits of Federally funded agricultural research?

Congress should consider and approve legislation that would establish the Agriculture Research Facilities Study Commission; the REE Policy Council; the National Research, Extension and Economics Advisory Committee; and appropriate funding for the reinvention of CRIS as described in response to question 27.

29. What should be the Federal role in insuring training of future work forces for the food and fiber needs as well as the natural resource concerns of the public?

If the nation is to have an outstanding scientific and professional work force, the problems of our educational system must be acknowledged and acted upon. Every arm of the Federal Government should contribute to restoring excellence in education. USDA is designated by Congress as the lead Federal agency for higher education in the food and agricultural sciences. Hence, USDA programs, particularly those falling under the Research, Education, and Economics mission area, are key to helping our college and university system achieve and maintain undergraduate and graduate education programs that will produce academically talented, multi-cultural graduates at the forefront of science and technology.

Research training, like legal, medical, and other training for complex tasks, has been successful under the apprenticeship model. Future researchers, often graduate students, learn the techniques and discipline of research under experienced research managers. This type of training is currently supported in our mission area through cooperative research agreements with land-grant universities, summer internship programs which expose students to government research, and research traineeships for graduate students through the Higher Education Programs' (HEP) National Needs Graduate Fellowships Program. The Multi-cultural Scholars Program provides 4-year scholarships to support undergraduate students from groups under-represented in the food and agricultural sciences. ARS supports 400 post doctorate employees annually to assist senior ARS scientists. This program provides young scientists with employment training opportunities, broadening their work experience and providing them with insights into career options within the agricultural sciences. ARS is able to hire about 10-15 percent of these scientists on a permanent basis while the remainder seek employment in other public or private sector institutions.

USDA should continue to provide leadership at the Federal level for stimulating colleges and universities to revitalize curricula, enhance faculty teaching competencies, use new technologies for improved delivery of instructional programs to our future work force, attract outstanding scholars, and increase the racial and cultural diversity of the food and agricultural sciences work force. Federal policies must encourage continued entry of the needed expertise into the food and fiber work force. Training to function in a global environment is essential to the future international competitiveness of agriculture. This work force will be primarily educated at our universities. By fostering excellence in higher education, we ensure that the expertise needed is available for the food, fiber, and natural resource systems of the country. The USDA, in cooperation with the land-grant university system, provides a vital link in meeting these needs. HEP's Institution Challenge Grants Program serves to strengthen the quality of undergraduate teaching programs at all institutions and the 1890 Institution Teaching and Research Capacity Building Grants Program provides for strengthening both research and teaching programs at the 17 historically Black land-grant institutions.

30. What is the continuing role of the Land Grant Universities? 1890s colleges?

The continuing role of the 1862 and 1890 land grant colleges and universities is consistent with their historical mission to (1) train future scientists and leaders in industry, government, and academia, (2) provide solutions to problems through research, and (3) disseminate this knowledge through outreach and extension programs. The 1862 land grant universities are the premier non-Federal, publicly-supported research and education institutions. The 1890 land-grant universities and colleges in particular, have been the principal means of access to higher education in the agricultural sciences for Blacks and other minorities.

One of the strengths of the land grant universities is their decentralized management structure. Decisions about allocating research and extension resources are left largely to the universities, subject to national review and approval, rather than a central authority. The decentralized structure, with the combined research-extension role of the land grant universities, has enabled agricultural and other constituencies to express their needs directly to the scientific establishment. The result has been increased communication among science-oriented research, technology-oriented research, and farm and rural constituencies. The USDA partnership has, at the same time, provided national coordination and assured that critical national priorities have been addressed. It has also served to direct research and extension resources to issues and problems that are important to individual States.

Another strength of the land grant university system is the ability to muster both public and private sector resources to solve problems. In fact, most of the post-1980 growth in public agricultural research has come from increased contributions from the private sector, mainly for research conducted at land grant universities. In real terms, Federal funding for agricultural research has been stagnant since 1976. Federal funding for extension work has likewise shown little real growth over recent years.

In an era of flat or declining budgets, regional coordination among research and education institutions will become more important. The Administration proposes a thorough review of the nation's agricultural research facilities and their capacities for meeting the needs of the future. The Agricultural Research Facilities Study Commission will review facilities on a regional basis, ensuring complementary work and coordination between land grant university research facilities and those of the USDA-ARS.

Another important step proposed by the Administration to ensure high-quality agricultural research at land grant universities and colleges is a competitive grant program for university research facilities to replace the current earmarking process and thereby ensure greater equity and relevance of Federally-supported research at land grant universities. Criteria for grant awards could reflect national research priorities in the areas of enhancing economic opportunity; reducing risk; having a healthier, better-educated citizenry; providing environmental benefits; and enhancing global competitiveness. This authorization would replace USDA's current facility construction authority.

A third area for reform in an era of tight budgets is in the Special Grants Program. The Special Grants Program is funded at $63 million for FY 1995, of which $57.8 million is earmarked. The earmarking of funds for expenditure in specific congressional districts through special grants is attractive to appropriators and constituents. However, the earmarking process undercuts USDA's ability to coordinate research activities and address national priorities. While earmarking of Federal dollars may respond to a need to serve local priorities, a more coordinated approach reflecting national priorities would be more justifiable.

Under the "Equity in Educational Land-Grant Status Act of 1994", 29 Indian Tribal Colleges were designated as 1994 land grant institutions with authorization for funding of an endowment for Federal, long-term support of teaching and education of Native American students. The law also authorizes funding for Extension programs, Institution Capacity Building Grants and strengthening payments. Federal support for the 1994 land grant institutions is critical to the teaching and extension programs of these schools who serve 20,000 students and more than 300 tribes throughout the country. Expertise and training is needed to develop the agricultural potential on reservations and increase employment for American Indians.

31. Is the current formula used for allocating Federal funds to land grant universities fair, reasonable, and does it address changing conditions? If not, how could it be improved?

Federal funds are allocated in two basic forms--formula funds and USDA Competitive Grants, which are described below.

Formula Funds. These are unrestricted block grants allocated to states for research and extension on agriculture, forestry, and veterinary medicine. Funds are allocated to States based on Congressionally-mandated formulas and are administered by USDA. The Hatch Act of 1887 supports agricultural research at State Agricultural Experiment Stations (SAES). The Evans-Allen Program (Section 1445 of 1977 Farm Bill) supports agricultural research at 1890 Colleges and Tuskegee University. The Smith-Lever Act of 1914 supports the programs of the State Extension Services. Extension at the 1890 Colleges is authorized in Sec. 1444 of the 1977 Farm Bill. The allocation of funds under these programs is based on rural population in the state and the farm population in the State. The Department does not recommend changes in these formulas. While including the value or income from agricultural production in the formulas, as some suggest, would better reflect the agricultural sector in each State, it is doubtful that the benefits that might occur would sufficiently offset the difficulty in obtaining agreement to change the formula.

Forestry research (at the Forestry Colleges and SAES's) is authorized by the McIntire-Stennis Act of 1962. Because the Forestry Research Advisory Council, which annually reviews the formula used for distributing these funds, has been diligent in ensuring that the formula is fair, reasonable, and addresses changing conditions, the Department does not recommend changes. The Animal Health and Disease Research Program (Section 1433 of 1977 Farm Bill) supports veterinary research at veterinary schools and SAES's. The Department has recommended that the total value of and income from aquaculture species in the various States become a part of the economic allocation base used in that formula. However the current use of a 3-year rolling average for each allocation base within the formula provides some continuity to the funding while it also permits adjustments over time that reflect changes in the agricultural sector among the States. For this reason the Department believes that the formula is equitable.

USDA Competitive Grants. USDA Competitive Grants, authorized by the Competitive, Special, and Facilities Grant Act, are awarded on the basis of submitted research proposals that are peer reviewed. USDA Special Grants are congressionally earmarked funds to specific land grant universities (or other entities) for specific research projects. Other USDA contracts, grants, and cooperative agreements, such as those offered by the REE agencies, provide additional research and extension project support to the SAES's and land grant universities. Several non-USDA Federal agencies, including the Department of Energy (DOE), Environmental Protection Agency (EPA), the National Science Foundation (NSF), and the Department of Commerce also support agricultural research projects.

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These different forms of funding have given USDA flexibility in allocating research funding. Formula funding provides some stability for States while grants encourage the research institutions to become more responsive to the priorities established by funding agencies. It also enables the USDA to draw upon the research and extension capacity outside the land grant university system.

32. The land grant universities have a system of agricultural experiment stations in each state. In today's environment of Federal and State fiscal constraints, is such an extensive system of research stations still warranted (please explain)? Could certain functions be merged with other USDA agencies, other Federal agencies, etc.?

Financial support for the State Agricultural Experiment Stations (SAES) has already changed significantly over the past several years as a result of a need to secure new sources of funds. The SAES's are funded by a variety of sources, including State governments, USDA, other Federal agencies (e.g. National Institute of Health and National Science Foundation), industry and product sales. State government and USDA funding of the SAES system has decreased in importance. In 1978, the State governments and USDA supplied 55.1 and 22.2 percent of total SAES research funding, respectively. This decreased in 1993 to about 48.7 percent of SAES funding provided by State governments and 19.7 percent of SAES funding provided by USDA. New sources of funds are being tapped by the SAES system. The proportion of SAES research resources supplied by industry and other Federal agencies other than USDA increased from 13.6 percent in 1978 to 19.6 percent in 1992.

There are strong arguments on both sides concerning the need and value of an extensive system of research stations. Some claim that the regionalization of the SAES system would serve to combine resources, reduce the duplication of research efforts, and increase economic efficiency by garnering economies of scale. Others contend that the regionalization of research can be hindered by administrative and political complexities, that some research is so site-specific that even research conducted in a nearby State is inappropriate for addressing local production problems, and that human capital development, science quality, and other benefits from links to State universities would be jeopardized.

Despite the debate, the trend seems to be toward cooperation and mergers. At the present time, considerable discussion is taking place among the land-grant universities to centralize responsibilities for certain crop and livestock programs. Other possibilities for regionalization include research in agricultural biotechnology, food safety, and rural development. But, it is difficult to merge various activities that are site specific. Problems associated with soil, the environment, plant adaptability, disease and insect control, and cultural practices are very often site-specific in the U.S.

Because of the significant State investment in agricultural research, State legislators also weigh in on this issue. The likelihood that USDA agencies or other Federal agencies could assume responsibility for research that is site specific is very questionable. It is not obvious that other Federal agencies have the capacity, expertise or interest to assume this responsibility. What is clear is that increased coordination among the agricultural research organizations will have to occur to most effectively use the limited resources in responding to critical State, regional, and national needs.

There is a need for increased coordination between SAES and the facilities of the Agricultural Research Service. The Administration's proposal for the creation of the Agriculture Research Facilities Study Commission is designed to address increased coordination.

33. How can agriculture research be best coordinated among Federal, State, and private institutions?

Coordination of research requires a clear understanding and ownership of the respective roles that Federal, State, and private institutions have in pursuing agricultural research. In this regard, a few observations can be made. First, private sector research tends to be "downstream" that is geared to applied research and with the express purpose of generating returns to investment as quickly as possible. Second, there is no evidence to suggest that Federal research "crowds out" private research. On the contrary, Federal research often enhances the climate for undertaking private research and frequently provides the fundamental research base needed by the private sector. Third, State funded research tends to focus on State and local priorities reflecting the demographic, agronomic, climatic and geographic features unique to a State's boundaries.

The different roles of Federal, State and private institutions suggest that research could be significantly complementary among research, and that with appropriate coordination mechanisms, scarce resources could generate significant benefits to multiple research needs. An excellent example of an innovative arrangement to capitalize on the different roles of Federal and private research are Cooperative Research and Development Agreements (CRADA's). CRADA's are formal arrangements between Federal laboratories and private companies to jointly develop and commercialize new technologies. USDA recently entered into its 500th CRADA and leads the Federal research sector in the number of CRADA's.

Another example of coordination between State and Federal institutions is co-location of ARS research scientists at facilities on land grant university campuses and university personnel in ARS facilities. Co-location creates greater opportunities for complementary and joint planning of research projects as well as joint training of graduate students. Excellent examples of joint efforts are found at Pullman, Washington; Logan, Utah; Ft. Collins, Colorado; Auburn, Alabama; Pendleton, Oregon; and Salinas, California. Often, this cooperation is more easily recognized at the local level and by individual scientists than is apparent at the national level. The proposed Agriculture Research Facilities Study Commission will be examining the complementary nature of ARS labs in relation to research being conducted at university facilities on a regional basis.

A prerequisite to coordination is communication. An improved CRIS database system and greater use of the Internet could facilitate the awareness of efforts currently underway at Federal laboratories and among university scientists in order to avoid duplication and identify neglected areas of research.

Communication among the Federal, State and private institutions will also be advanced through the proposed National Research, Education, and Economics Advisory Committee. The Committee would include representatives from each of these institutions. The Committee would be responsible for determining priorities for national research in relation to the needs at the regional level. The Committee would also be involved in providing customer input into REE's strategic plan.

34. What models currently exist and are in use to provide regional cooperation in research and extension?

Regional associations exist for the Agricultural Experiment Station Directors and the Cooperative Extension Service Directors to increase communication and coordination of programs. Coordination and cooperation on a regional basis for extension is focused by bringing together the university administrators associated with agricultural and natural resources, home economics, youth development, community development and others on an annual basis. Many examples exist where programs are planned and executed jointly such as leadership development, development of educational materials, and the joint delivery of programs via satellite technology. Cooperation in responding to drought and floods, as well as technical support of production agriculture has occurred. The regional research program is an excellent example of coordination on a regional basis. At the present time, there are approximately 170 projects in the regional research portfolio which serve to bring about regional cooperation. The regional research model has been in operation since 1947, and is working extremely well. ARS Administrators actively participate in the regional association meetings, as well as ARS scientists who are active contributors to regional research projects.

Regional models for extension exist, and are growing, largely on a case-by-case basis, but are less developed than research. Lack of regional extension funds and diminishing discretionary funds available at the national level have hampered development of systematic regional extension models.

Perhaps the strongest model for regional cooperation in research and extension is found in the administration of the Sustainable Agriculture Research and Education (SARE) program. There are four regional Administrative Councils and technical committees, comprised of university scientists, nonprofit organizations, farmers and ranchers, consumers, environmentalists and agribusinesses. The award priorities and criteria are set according to the needs of producers unique to each region. Because producers sit at the table when grant applications are developed and funding decisions are made, money is spent addressing producers' questions. Often the projects are awarded to multi-State teams of researchers and producers. The SARE model has proven to be an effective, decentralized model for organizing need-driven, regionally-identified research and extension efforts.

35. In the current era of constrained resources, is it appropriate to use Federal funds to promote cooperative regional research to reduce unnecessary duplication; and to what extent is it appropriate to use Federal funds to encourage consortia of states to establish individual centers of excellence to address common problems?

It is appropriate to use Federal funds to support and promote cooperative regional research, and funds are currently being used for this purpose. Efforts are underway to reduce duplication in the limited number of cases where it is a concern and to identify certain States to assume specific responsibilities for a particular region or area of research. Germplasm preservation is an excellent example of regional cooperation where a single State conducts the research for the benefit of the total region. Because the States are experiencing a reduction in the number and available expertise of scientists, the question emerges as to whether research can continue to meet the needs of a single industry or commodity. A further problem is that the loss of research support for an industry in a State or region will reduce its competitiveness regionally, nationally or internationally. These problems are recognized and are being addressed.

Cooperative regional research efforts could be further encouraged by Congress. In the 1995 Farm Bill Guidance of the Administration, several proposals are outlined that would promote cooperative regional research and reduce unnecessary duplication. The Administration proposes a thorough review of the nation's agricultural research facilities and their capacities for meeting the research needs of the future. The Agriculture Research Facilities Study Commission will review facilities on a regional basis, ensuring complementary work and coordination between land grant university research facilities and those of the USDA-ARS.

Another important step in ensuring high-quality agricultural research at land grant universities and colleges proposed by the Administration is a competitive grant program for university research facilities to replace the current earmarking process and ensure greater equity and relevance of federally-supported research at land grant universities. Criteria for grant awards could include the demonstration of service to regional research needs in collaboration with existing research facilities.

A third area for reform is the Special Grants Program. The Special Grants Program was funded at $63 million for FY 1995 of which $57.8 million is earmarked. The earmarking of funds for expenditure in specific congressional districts through Special Grants is attractive to appropriators and constituents. However, the earmarking process undercuts USDA's ability to coordinate research activities and address national priorities. Instead, these monies should be awarded as competitive research grants. Greater regional cooperation could be emphasized as criteria for making awards to consortia of States.

Centers of Excellence offer significant opportunities to maintain a research presence in a region when an individual State can no longer afford to maintain the full complement of scientists required. There is a need to encourage States to come together to establish Centers of Excellence, and the use of Federal funds to offer the "carrot" to develop the process has real merit. The results could mean maintaining an expertise in the region, helping to maintain an economically viable industry, and reducing the expense of duplicating infrastructure and equipment.

36. As societal concerns about natural resource use, rural development, animal well being, etc., are integrated into the USDA agenda, is there a role for "new" partnerships with the Federal sector?

Absolutely. In its guidance for the 1995 Farm Bill, the Administration recommended establishment of a Research, Education and Economics Policy Council to help improve linkages between USDA's agricultural research activities, related decision making, and operations of the USDA action agencies.

The integration of biological and social sciences is one of the foundations of the REE mission area. Social, economic, and related sciences provide significant contributions and stimuli to the Federal agricultural research program, and vice versa. Expanded partnerships will permit (1) economies of scale, (2) the application of comparative advantage in conducting technological activities, and (3) the elimination of duplication. Any new partnerships must be visible and include private industry, interest groups, and all facets of Government. We must also increase linkages with our current partners. Much success has been enjoyed in dealing with our external partners, and we should continue to create stronger partnerships internally.

In creating new partnerships, USDA research agencies must communicate with a wide variety of organizations and interests in order to determine societal needs. The creation of one consolidated advisory committee which represents all major areas of concern about agricultural research will serve this function. Particularly important for potential customers will be open lines of communication for information exchange, clarification of issues, goal setting, objectives, expected outcomes, and the development of funding and other resource needs and strategies. This approach will also ensure that the reasoning behind decisions affecting conflicting segments of society are clearly articulated.

New or expanded partnerships at the Federal level have the potential to address many of the Nation's agricultural research goals. The infrastructure and the resources for creating a more integrated research agenda attuned to human issues are in place within the structure of the USDA/REE Mission Area. With vision, determination, and political will, these partnerships can effectively develop an integrated research plan for the future.

37. Other parts of the Federal Government sponsor research directly applicable to the food and agriculture system. The National Science and Technology Council is intended to address the coordination of related activities across agencies. How is this intended to work in the case of research and extension on food and agriculture? How well is it actually working? Are alternative methods needed?

The National Science and Technology Council (NSTC) and its support staff provided by the Office of Science and Technology Policy (OSTP) have launched an aggressive agenda over the past several years to inventory and coordinate research and development activities among all Federal agencies and to develop strategic plans in program areas relevant to multiple agencies. These strategic planning activities have been very positive in that they have involved a broad array of external customers and partners to identify research needs and validate the research directions of Federal agencies.

Probably the most apparent benefit of the activities to date is an increased awareness among Federal agencies of related program activities in other agencies. This has fostered program coordination, cooperation, and resource-use efficiency. However, actual changes in program emphasis among Federal research and development (R&D) agencies attributable to NSTC activities are not yet apparent. Many participants in the process feel that the potential strategic planning benefits have been negated by the overwhelming impacts of Federal budget reductions, organizational streamlining, and staff reductions.

With regard to food and agriculture interests, USDA has been a very active player in NSTC activities. Most of the USDA involvement has related to two of the nine committees, namely the Committee for the Environment and Natural Resources and the Committee on Health, Safety, and Food. However, food and agriculture issues in these and other committees have been overshadowed by more dominant and vocal interests in medicine, computer, defense, communication, and environmental research. The USDA research budget is only about 2 percent of the total Federal R&D expenditure. Given the importance of food and agriculture to the Nation and the world, the Federal investment in agriculture research is out of balance or under represented relative to other research sectors. USDA is continuing to actively participate in the NSTC process and to promote the health, economic, environmental, global competitiveness, and national security benefits to the American public arising from food and agricultural research.

38. Congress authorized the National Research Initiative (NRI) Competitive Grants Program at $500 million per year. If the NRI is to be fully funded, where in the USDA research budget could money be transferred from?

If the NRI is to be fully funded at $500 million per year, some additional funding for the NRI could be transferred from earmarked special grants. In this way, more grant funds for agricultural research would be awarded competitively to projects of greatest merit as evaluated by scientific peers. "Merit" includes both scientific quality and relevance of the proposed research to regional and national needs of the U.S. agriculture-food-environment system.

Funding the NRI in place of earmarked special grants would also simplify the USDA research budget into three components: 1) intramural research; 2) research partnerships with states funded by formula funds; and 3) competitive grants, with wide participation by the scientific community.

39. What other options for funding the NRI should Congress consider?

The 1995 Farm Bill Guidance of the Administration made a strong recommendation for termination of all earmarks for university facilities and Special Grants. Funding for congressional earmarks can range from $100 million to $300 million. These dollars have been traditionally used for making non-competitive grant awards that often do not reflect the national research and education interests. These funds could instead by awarded to highly-qualified scientists whose proposals undergo a peer review process.

For FY 1995, funding for the NRI Competitive Grants Program was authorized at $500 million annually. However, about $100 million was actually appropriated and only about 20 percent of the projects submitted to the NRI could be funded. A shift in funding away from congressional earmarked special grants to the NRI, would contribute an additional $100 million to ensure high-quality research and greater applicability to national research needs.

40. Have NRI appropriations been used to expand agricultural research or have they been used to continue existing programs?

NRI appropriations have been used to both continue existing programs and expand agricultural research. Some of the most significant accomplishments of the NRI are in areas of research that were supported beginning in 1978 when the USDA Competitive Research Grants Office was established. The Competitive Research Grants Office was subsumed by NRI with its establishment in 1990. It should be noted that the amount of funds used to support these original programs are less today in real dollars and significantly less when adjusted for inflation compared with the earlier levels of funding. Funds redirected from existing programs and each increase in appropriation to the NRI have been used to expand agricultural research.

Four new programs were added to the NRI in 1991. These were: Plant Genome, Water Quality, Forest/Rangeland/Crop Ecosystems, and Food Safety. The Forest/Rangeland/Crop Ecosystems program was an expansion of a former forest biology research program. The NRI appropriation starting in 1992 was used to expand the program further to include programs on Markets, Trade and Rural Development, and Processing for Value Added Products, including food and nonfood products made from agricultural commodities. In addition, the Strengthening Program was added in 1992, which includes research career enhancement awards, equipment grants, seed grants, and standard research grants to investigators at small and mid-sized institutions and in States historically less successful in competition for USDA grants. Five more programs were started in 1994, funded mostly by redirection of NRI appropriations. These were Biological Control Research, Assessing Pest

Control Strategies, Soils and Soil Biology, Water Resources Assessment and Protection, and the Agricultural Systems Research Program. In addition, the Ecosystems program was expanded to include aquatic ecosystems.

The peer review procedures used by the NRI to select projects for funding also assure that the agricultural research funded by this competitive grants program is highly dynamic and scientifically the most advanced in all programs. Only about 25 percent of the projects funded each year are renewals or continuations and the remaining 75 percent are new projects.

The NRI appropriation is also used to expand agricultural research by virtue of its mandate to fund the widest participation of eligible U.S. scientists, including scientists at public non-land grant and private universities and institutions traditionally not funded by the USDA.

41. Should the USDA have research laboratories or should it provide competitive funding to existing entities such as universities?

Both of these research funding approaches are absolutely critical for USDA and they serve important complementary roles. Federal laboratories are essential to sustain research efforts on national problems without regard to geographic or political boundaries and the constraints of conflicting State or local interests. It is responsive to the Secretary, the President, other Executive Branch agencies, and the Congress to meet new or expanded needs as they deem priority. USDA's in-house resources--its laboratories, equipment and its cadre of multidisciplinary scientists--provide a ready capability to immediately attack urgent problems as demonstrated by the recent outbreaks of TCK Smut, Russian Wheat Aphid infestations, and Bovine Tuberculosis.

An example of a unique and expensive facility required for the national interest is the exotic animal disease research at Plum Island, New York. An independent Federal scientific work force provides the core capability to respond immediately to national emergencies and research needs. For example, the recent E.coli outbreak was rapidly and effectively addressed by a mobilization of relevant scientific resources at multiple USDA laboratories nationwide. In addition, USDA Research Laboratory in Clay Center, Nebraska developed a rapid bacterial diagnostic test. This test assisted in the establishment of food quality control strategies by industry and Government for meat inspection and reducing bacterial contamination of livestock. For this, and similar national emergencies such as crop pest outbreaks involving the silverleaf whitefly and the potato late blight disease, competitive funding mechanisms alone would not have provided or sustained all of the essential core capabilities that were required for rapid mobilization.

U.S. Federal scientists are often crucial to international technical negotiations because many foreign governments will only honor the credibility of such national experts. ARS also provides the continuity of research resources needed to facilitate the development of solutions to complex problems. The long-standing, in-house research organization plays a pivotal role in providing leadership and focus to the Nation's total agricultural research. This is analogous to the national research direction that the National Institutes of Health provides for biomedical research nationwide.

Universities also play essential roles in the agricultural research and education system. In addition to their primary responsibilities to educate and supply the future scientific work force and address State and local agricultural problems, they collectively provide a national scientific resource to exploit new science opportunities and assist in addressing national research needs. Competitive funding mechanisms provide the supplemental funding required by universities to support fundamental science oriented projects having long-term potential benefits in the national interest.

42. Should more ARS laboratories be co-located at land grant universities? What should be the relationship between ARS and land grant university scientists? Between ARS research coordination? How can ARS laboratory functions be more effectively linked to State Agricultural Experiment Stations?

In some cases, it makes strategic sense to co-locate ARS laboratories on university campuses when research programs and scientific expertise share common or complementary goals and objectives and the research results will be of mutual benefit to State and national interests. Programmatic benefits must be the dominant consideration for co-location.

In other cases, there is a critical need for ARS laboratories to be located in geographic areas - sites with specific research needs - locations that happen to be isolated from the university campuses. For example, in the Great Plains region, many of the universities are located on the edges of the region in more densely populated cities. ARS has located a network of field locations at strategic sites within the Great Plains, providing the geographic coverage to study and respond to the diverse ecology. In these situations, universities often co-locate some of their scientists at these ARS sites.

Where ARS labs are co-located with land grant universities, the relationship between ARS and land grant university scientists should ideally be based on principles of complementary goals, cooperation and reciprocity. Monetary or in-kind support provided by both sides is essential to accomplish partnerships. Co-location generally creates the opportunity for awareness of each other's research agenda and affords the opportunity for cooperation. Cooperation is fostered through Research Support Agreements, adjunct faculty appointments for ARS scientists, ARS scientists serving as major advisors or serving on graduate students' thesis committees, and formal or informal regional research committees and working groups. Co-location offers the advantage of coordinated research and planning, training of graduate students and employment opportunities for post-docs in ARS labs. Co-location can also offer the advantages of shared resources like computing facilities, equipment, molecular biology services and a pool of trained technical workers.

The absence of co-location does not mean that cooperation and relationships do not exist. For example, at ARS' Regional (Utilization) Research Centers we have interactions with both land grant and private institutions. The Eastern Regional Research Center in Philadelphia is not on a university campus but works with state universities in Pennsylvania, New Jersey, Delaware, and the seven nearby medical schools and several private universities in the Philadelphia metropolitan area.

Modern information technology creates another alternative to achieving the benefits of co-location without the physical requirement of place. Another model for cooperation can be the "virtual laboratory" where scientists, physical resources and private sector partners are assembled by electronic communication networks to address specific national research programs for a fixed time. As component tasks are completed, unneeded resources are redeployed to other high priority areas. Even the old argument of intellectual critical mass and library resources are moot with the Internet tying information sources together into a single system.

ARS laboratories can be effectively linked to State Agricultural Experiment Stations through joint strategic planning. Areas for cooperation can be identified and duplication can be avoided by involving each party in each other's respective planning process. Activities such as project/program computerized networks, various cooperative agreements, regional projects, and formal and informal working groups could then be initiated. ARS and Experiment Station scientists could also be more effectively linked through funding focused on specific researchable problems accessible through competitive grants that reward collaboration between ARS and Experiment Station scientists.

The issue of co-location will be one of many that would be addressed by the proposed Agriculture Research Facilities Study Commission. The commission will review all Federal facilities in relation to university and experiment stations to identify those that should be closed, realigned, consolidated, or modernized, according to criteria that will enable USDA to respond to the needs and challenges of the next century.

43. Are ARS laboratory facilities effectively used in performing needed research? If not, please explain and offer suggestions for better use?

Yes. Most of the ARS facilities are being used in an appropriate fashion for which they were designed and most are adequately staffed. However, ARS has several facilities that are old and need to be modernized to meet current safety and health requirements and standards of scientific excellence. Also, the types of research that ARS is currently doing and will do in the future will require continued improvement/replacement of facilities if the capability to deliver solutions to agricultural problems in a timely fashion is going to be maintained. As budget pressures continue to increase and the need for multidisciplinary scientific teams to address agricultural problems also increases, it may be necessary for ARS to consolidate some programs at the larger locations and close some of the smaller and/or outdated facilities. To systematically and objectively assess the need for such laboratory closures and/or consolidations, the Department has proposed, and strongly encourages the Congress to authorize, the establishment of the Agriculture Research Facilities Study Commission.

44. The USDA Extension Service's (ES) mission is, among other things, to disseminate research results to farmers and other customers. In your opinion, is the ES effective in carrying out this mission? (please explain).

When the Extension Service was created, there were few to no private sector sources of information available for farmers and ranchers to deal with their immediate problems. The Extension Service has historically played a dominant role in the transfer of research from public institutions to commercial producers.

Today's farmers are more sophisticated. Farmers are likely to have undergraduate and graduate degrees in various fields of agriculture. At the same time, the private sector supporting production agriculture has matured. Industry has emerged around providing information and technology to farmers that will produce profits for private firms while also solving farmers' problems. Even with these dramatic changes, surveys showing where farmers get information for decision making almost always list Extension as one of their main sources. Usually Extension is ranked after other farmers and feed/seed dealers, and yet Extension is often a primary source of information for these dealers.

As the U.S. moves away from the command-and-control approach to solving environmental problems, the role of Extension as a deliverer of information will become even more critical. On issues involving the environment, where the benefits are "public goods", there will be little or no incentive for private companies to make this kind of information available to individual producers. For example, to deal with the issue of water quality, there is no sales force or advertising agency to promote cover crops or composting even when these strategies might prove to be economically beneficial to farmers. Extension can be more effective by recognizing where it can deliver "public goods" that would otherwise be ignored by the private sector.

45. Should the Extension Service be involved in addressing the problems and challenges confronting urban populations?

Yes. Many of the problems and challenges confronting urban populations are similar to those confronting rural populations. Extension's educational programs including family development, nutrition, food safety, youth development, horticulture, gardening, environment, leadership, and economic development address the audiences asking similar questions regardless of whether they live in rural or urban America. These programs are educational programs that allow people to help themselves.

Land-grant universities have responsibilities to extend their knowledge and research base to both rural and urban communities in their States. The Cooperative Extension Service program is a strong partner in the university's broader outreach efforts. USDA as the Federal partner provides just under 30% of the total budget of the Extension system. The remaining 70% is provided by 50 State legislatures and 3,150 units of county government.

Nutritionally vulnerable groups in our society such as the very young, the elderly, pregnant women, and women in child-bearing years exist in both urban and rural communities. The research that identifies effective ways of overcoming the barriers to a more healthful diet and lifestyle is little affected by geography. However, the density of the population is a consideration in finding cost-effective delivery mechanisms.

The mission of 4-H is to assist youth in developing knowledge, skills, and attitudes that will enable them to become self-directing, productive and contributing members of society. The educational programs which have been successful in rural areas have had equal or greater success in urban areas with little or no adaptation.

Many of Extension's programs that have positive impacts on individuals in urban and rural settings help reduce other costs of expensive treatment programs that draw heavily on society. Productive and healthy youth and adults are far less likely to become dependents of society.

Cooperative extension staff and programs are funded by county, State, and Federal sources. It is recognized that urban counties who provide significant funding for extension programs will expect problems important to them to be addressed. Extending the university expertise in this funding environment will dictate that attention be given to urban programming.

46. What if any role should ES play in dealing with the social issues facing farmers and rural communities?

The Extension Service has historically conducted public policy/public issues education programs for all Extension customers. These programs have often concentrated on policies and issues most directly related to production agriculture. More recently, attention has been given to social issues facing farmers and rural communities, partly in recognition of the fact that these social issues are related to the communities in which farmers live.

Many of today's issues will increasingly affect farms and rural communities. For example, Medicaid and Medicare reform could significantly influence the availability and affordability of health insurance coverage and health care services for farmers and rural communities. National welfare reform can be expected to put upward pressure on local government revenue sources (primarily the property tax, including farm property) and, thus, directly impact farm profitability. Similar farm and rural community effects can be identified for issues such as nutrition, the environment, business development, youth and family life, and virtually all major national policy issues.

In recognition of these trends, the Cooperative Extension System has placed a significantly increased emphasis on staff development and training in public policy/public issues education for all Extension staff members. The development of Public Issues Education materials and staff development activities continues to receive high priority within the Cooperative Extension System, as well as the delivery of policy education programs by Extension clientele. Therefore, the Extension Service will be expected to play an even more active future role in broad public social issues education.

47. Should the ES's mission statement be changed to focus activities on production agriculture?

The mission of Extension should not be changed to focus solely on production agriculture, even though a major emphasis is placed upon production agriculture in Extension programming. Viable rural businesses and communities, as well as enhanced quality of life for all people, require Extension to maintain a comprehensive role rather than a single target of production agriculture. Rural counties have shifted toward manufacturing and service sector based economies, and are less dependent on agriculture-based economics than they were 15 years ago. During the last 20 years, significant shifts in Extension programming have occurred within the agricultural and natural resources area. More emphasis is placed on environmental and management issues and public issues related to the rural-urban interface. For example, water quality programming more than tripled during the period and integrated pest management grew from a concept to a significant program today, which addresses issues throughout the entire agriculture and natural resources program area. These shifts have been possible by devoting fewer resources to traditional production issues where the private sector has been able to provide more information and assistance.

While the Extension Service has made great strides in focusing our programs to address the most important national issues, Extension recognizes that it must continue to demonstrate to the public that it is using research, extension and education to solve important problems; that we are producing knowledge that creates new opportunities; and that we are accountable for the public funds and trust. The Under Secretary for Research, Education and Economics, has created an Extension Working Group to answer a number of questions relative to the role of CES. These questions get to the very core of the reason for CES's existence and its present and future responsibilities to the American people. The Working Group, which reflects a wide variety of experience, training and background, will report its results to the Under Secretary in early 1996.

48. What should ES not be involved in?

Extension should not be involved in activities that compete with private sector entities, activities that compete with other public sector organizations, or activities in which the primary outcome is private economic benefit. Extension should not engage in activities that individuals should do for themselves, that regulate, or protect a clientele base, or programs that do not involve learning.

The Extension mission is broadly defined to help people improve their lives through an educational process that focuses scientific knowledge on issues and needs. Providing the knowledge and skills to help people make informed decisions is in keeping with the original, as well as the continuing purpose of the Cooperative Extension System (CES). However, it should be noted that Extension does not now, nor should it at anytime, attempt to address all issues of the nation, state or county.

The research and technology base of the land-grant universities provides the foundation for Extension programs, and supports the on-going program and professional development of Extension personnel. This research and technology base also enables CES to effectively respond to problems and particular needs of people and communities. Extension programs traditionally have been developed to address a variety of needs of the American people who, in the past, were largely rural and farm families. It continues today to address those needs of the farm and ranch production sector, as well as those issues where a national network is essential to enhancing success. One of the strengths of CES--its flexibility--has allowed Extension to respond to changing needs and demographics, advancing technologies, and changing environments. Therefore, the research findings of our universities have continued to make a difference in the lives of our citizens through a System that has changed and adapted along with the general population. Today, as in the past, the focus of CES is limited by the mission of the land-grant universities, by funding, availability, and by program priorities identified through a cooperative process.

49. Do you have any suggestions on how USDA's dissemination of Federal agricultural research results can be improved?

Marketing of information, research results, and statistical data is a function of REE agencies within USDA. The developments in information technology provide a great opportunity for more efficient methods of disseminating research results and research data sets through Internet and any other public information networks. For example, the Joint Council for Food & Agricultural Sciences distributes its annual report on research, extension, and higher education accomplishments on the World Wide Web (USDA/CSREES home page). This report, describing the impacts of REE and State programs, is also transmitted to the land-grant partners, Congress, and the Administration. The establishment of non-traditional partnerships with Federal and/or State agencies can create new opportunities for data dissemination and link data bases which are usually available separately.

Currently there are ten Information Centers at the National Agricultural Library (NAL), the largest agricultural library in the world. These centers serve as resource clearinghouses involving both information collection and dissemination. Newsletters and electronic mail groups are found in the Office of Small Scale Agriculture, Office of Agriculture Biotechnology, and Sustainable Agriculture. Enhanced communication to the public concerning available resources generally results in large increases in numbers of calls and requests from USDA employees, private industry, nonprofit organizations and individuals.

50. Who is, or will be, responsible for developing a marketing plan for agriculture and its science and education programs to the American people?

The USDA Research, Education and Economics mission area has the responsibility to develop a marketing plan for its science and education programs. REE is currently undergoing a review of the mission area's communication capabilities, resources and publications and media activities. A new communications strategic plan is being developed as a component of the REE Strategic Plan. The plan is being formulated with the intent of increasing the recognition of the contributions of public research to agriculture, food safety and accessibility, natural resource conservation and improving the quality of life for Americans.

51. ARS uses the Current Research Information System (CRIS) to provide information about USDA research projects. How, if at all, do you use CRIS?

CRIS is a computerized database used by all USDA research agencies, land-grant universities, and other collaborating universities to document, clarify, and inventory their agricultural research activities. It allows scientists to determine the scope of research in progress as they design and implement new approaches. Therefore, CRIS is used to avoid duplication of effort. From a managerial perspective, it serves as a historical records repository and provides documentation of trends in investment levels related to specific commodities. To enhance the use of CRIS, accessibility needs to be improved; data entry needs to be more timely; and the database should be modified to include results from extension and higher education projects, and plans for future activities.

The CRIS has limited use in some areas of NASS research because of confidentiality or U.S. Code restrictions on dissemination of data.

Research projects conducted or funded by ERS are documented in CRIS. This documentation is reviewed and updated as part of the agency's annual program planning process. ERS researchers also use CRIS to identify projects related to their areas of interest and as a source of information and data for economics research resources.

52. In your opinion, is CRIS effective in helping you obtain information on Federal agricultural research projects? If not, what changes are needed to this information system that would provide quality data on Federal and State agricultural research? (please explain)

CRIS has been increasingly asked to provide answers it was not designed to supply, thus, updating the system is essential. CSREES funded a $100,000 software/hardware purchase from FY 1995 appropriations to improve search efficiency and reporting. It allows an up-to-date platform for testing long-term improvements. In addition, procedural and equipment changes are recommended for CRIS as well as expanding the taxonomy for more flexible classification alternatives. CRIS needs to be on the Internet to give a greater number of users full functional access as well as analytical information for management decisions. These changes would require internal changes to allow more interactive processing and access to data while targeting key areas of national interest. The positive characteristics and programs of CRIS should be maintained, while updating the taxonomy, classification system, and electronics to make it state of the art.

Because of the problems mentioned above, CRIS is not as useful in today's environment as it was when it was designed. Current studies are identifying user needs and designing databases that are more user friendly. The plan enables an expansion and revision of the taxonomy, adds additional databases to meet priority needs (e.g., regional research), provides linkage to other operating systems and allows the general public immediate access to any accomplishment information that we have available (e.g., NRI project summaries). It also involves a mechanism for securing counsel from all concerned USDA agencies, as well as the overall research community.

A task force of USDA and university members will be assembled to improve the taxonomy, design new databases and improve the reporting system. In order to provide program outputs that are required for responding to GPRA, financial data and information focused on impacts will be needed.

53. Is there/should there be an appropriate and adequate management information system(s) in place to report and collate results from Federal investment in research, extension, and higher education sponsored by the USDA (and related research agencies)?

Currently, there is no comprehensive system in place across the Federal sector that documents all agricultural and related program research, or extension and higher education activities. The CRIS system only reports USDA in-house research programs or research that is funded totally or partially with USDA funds in the Land Grant System. Extension and higher education activities are not documented in a central database at the national level. Development of technology by USDA agencies in other mission areas is not included. Also, agricultural and food science activities supported by other Federal agencies such as NSF, EPA and NIH are not reported in CRIS.

There should be a comprehensive database and management information system in place for Federal investment in research, technology development, extension, and higher education. CSREES is providing leadership to the process of developing the management information system for the REE mission area.

CSREES is in the early stages of developing a conceptual outline for making incremental changes in CRIS data classification and entry, as well as establishing a foundation for the next generation of an information system for REE. At the same time, we are identifying a pool of appropriate individuals from other USDA agencies, the private sector and other Federal Agencies, (e.g., NAS, OSTP, DOE, NASA, DOD, NSF, etc.) from which we may request several to serve on a task force charged with providing objective and forward-looking counsel to the

Department specific to identifying key characteristics, essential and optional components, and desirable accessibility features of an REE information system to meet future management needs and to provide valid current and historical data.

54. Does the CRIS system and other USDA reporting systems provide an adequate accounting of the research and extension work that is being done in America?

CRIS was designed to account for Federal investments in agricultural research and research outputs. It does include information on research projects conducted by USDA agencies and collaborating universities. CRIS does not include Extension programs. There is not a comparable system available; therefore, Extension has opted to require States to develop work plans as a corresponding system. The CRIS as now used is inadequate for accurate reporting and true accountability of all research and extension work that is being done in America.

The manner in which ARS uses CRIS and associated systems for resource allocations and accountability comes closest to being adequate. In ARS, the Research Management Information System (RMIS) uses CRIS and additional data elements as one of three main systems to plan, allocate, and track expenditure of Federal funds. RMIS is used to track research programs. An associated system is used to plan utilization of annual funds, and yet another system tracks actual expenditure of funds. Using these three systems, ARS has improved its ability to set priorities, plan, execute, accurately report research, and account for Federal funds.

55. How can the USDA be most effective in the short and long term through its support of international activities?

USDA has much to gain by supporting international activities. For instance, joint international research efforts can give USDA broader access to physical material such as germplasm, to intellectual scientific knowledge from projects that are unique in other countries, and to a broad range of data. Joint research that takes advantage of the broader base of knowledge and physical material can lead to the development of technologies that can be commercialized either unilaterally or in conjunction with multi-national firms, creating jobs and sales. This is particularly important in a post-NAFTA and GATT agreement setting. USDA participation in international activities also provides the basis for familiarity with policies, programs, institutions, and cultures in other countries, knowledge which can be vital in sensitive negotiations or in establishing market opportunities.

The effectiveness of USDA in supporting international activities rests on a vision of what needs to be accomplished, a commitment to designing and maintaining interactions that will get results, and informing the taxpayers and consumers of what they have gained from these activities. Supporting international research activities requires:

- The exchange of scientists;
- Appropriate staffing of the International Agricultural Research Centers;

- Coordination and communication across research centers, ministries and departments of agriculture, and scientific and educational institutions;
- Recognition by Congress and other funding organizations that support of international activities requires long-term commitments and predictable levels of funding; and
- Attention to the training of scientists so that there is a flow of new knowledge and a continuing human capital base;

USDA can be most effective if given a clear mandate to develop and articulate the vision of a well-fed world that rewards its producers while protecting its resources. The newly completed USDA reorganization created a Research, Education, and Economics mission area that has the expertise, the international recognition and the linkages necessary to shoulder the visioning and coordination of effective international interaction. Congress has the oversight and budget authority to direct the responsibilities to USDA and to direct the REE mission area to be a focal point of international research activities.

USDA-REE has already established partnerships with Eastern Europe, the former Soviet Union, and Southern Africa to help these countries and regions to develop their agriculture sectors. Over the next ten years, these countries can be expected to undergo the kind of rapid development experienced by the "newly industrialized" countries of Asia in the 1970's and 1980's. Agriculture will be a vital component in fueling development in these countries and ultimately result in increased trade with substantial benefits to U.S. consumers and farmers.

56. Currently, USAID and other programs extend agriculture and agricultural development beyond the nation's borders. What continued or expanded role should USDA play in international research, education, and extension?

Although support has declined in recent years, from the 1950's through the 1980's, USAID provided substantial support for international agricultural development efforts. Agriculture has declined significantly both in funding levels and in the overall strategy of USAID over the past decade. In the 1970's and early 1980's, agriculture was a mainstay of USAID's development efforts. USAID's focus has now shifted away from both economic growth and agriculture to population and health, environment, and democracy. USAID currently spends about $80 million for agricultural research.

USDA participates in USAID's program because such efforts offer economic and technical benefits to America agriculture such as increased opportunities for agricultural trade, and access to new agricultural technologies and germplasm. USDA should expand its role in international research, education, and extension to fill the gap caused by USAID withdrawal and ensure that the U.S. agricultural sector continues to benefit from opportunities provided by the development of the global agricultural sector.

Enhancing agricultural research. USDA could be more actively involved in international agricultural research and play a direct role in U.S. Government relations with international research centers, including a prominent role in the donors committee which establishes research priorities and provides oversight for the International Agricultural Research Centers (IARCs).

Fostering agricultural development. USDA could also play a more direct role in supporting agricultural transformation. Agriculture becomes an engine of growth primarily through agricultural transformation—the movement from household-based agriculture to commercial agriculture. As countries develop, they not only hold potential as markets for U.S. commodities (as rapidly growing Asian countries demonstrate), but they also provide opportunities for the U.S. to influence the process of agricultural transformation itself. When we help establish agricultural systems which are market-oriented and compatible with our processes and institutions, we create better negotiating and trading partners for ourselves. Many countries are now seeking assistance in designing components of such modern agricultural systems such as statistical and economic reporting systems, extension services, inspection systems, grades and standards, and market news operations. USDA is successfully providing such assistance in Eastern Europe and Russia.

Improving partnerships with USAID. In the past, USAID has contracted with REE for some agricultural research activities, primarily through hiring USDA employees in USAID offices with research missions and through funding from the small grants and mission or regional programs. These mechanisms have been limited and piecemeal. Increased collaboration could more effectively tap the technical and research expertise in REE and provide high quality research. This could unlock the potential for market growth and provide opportunities for U.S. agriculture.

57. What is the role of USAID in funding agricultural research and extension? Has USAID maintained support for agriculture or has the agency moved away from agriculturally related programs? What is the role of long-term agriculture R&D in developing countries in developing new markets for U.S. products? Should USAID contract through USDA/REE for long-term agriculture R&D?

USAID provides funding, about $80 million in FY 1995, for international agricultural research. USAID funds agricultural research through: collaborative research support programs (CRSPs), grants to the International Agricultural Research Centers (IARCs) through the Consultative Group on International Agricultural Research (CGIAR), the small grants program, and projects and programs developed by USAID's country missions or regional bureaus. These programs have provided major benefits to global agricultural development. They have also made new technology and germplasm available to U.S. agriculture which have been widely used to increase productivity.

Support for agriculture has declined significantly both in funding levels and in the overall strategy of USAID over the past decade. In the 1970's and early 1980's, agriculture was a mainstay of AID's development efforts. USAID's focus has now shifted away from both economic growth and agriculture to population and health, environment and democracy. USAID currently spends about $80 million for agricultural research.

Stimulating economic growth is the major requirement for developing new markets for U.S. agricultural products. Long term agricultural research plays a critical role in economic growth and development. Increased agricultural productivity is key to agricultural transformation—the movement from household based agriculture to commercial agriculture—in developing countries. Agricultural transformation in turn fuels economic growth by generating income and employment and creating increased demand for both domestic and imported goods. Increases in agricultural productivity in developing countries will be fueled almost entirely by the development and transfer of new technology in appropriate institutional frameworks, which in turn will depend on long term research investments and on the ability to translate research into real technologies and get these into the hands of farmers and entrepreneurs. Several options for continued U.S. involvement in the IARC's and CRSP's should be explored as USAID's support for these efforts decreases. Contracting through USDA/REE or transferring these programs to USDA/REE are viable alternatives to assure that U.S. agriculture continues to benefit from these programs. USAID has contracted with USDA/REE for some agricultural research activities, primarily through hiring USDA employees in USAID offices with research missions, and through funding from the small grants and mission or regional programs. These mechanisms have been limited and piecemeal. In the future, by contracting directly through USDA/REE for long-term agricultural R&D, USAID would have a close liaison with USDA research and extension programs, including technological development and commercialization.

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October 31st, 1995

The Honorable Pat Roberts
Chairman, House Agriculture Committee
Room 1301, Longworth House Office Building
Washington, DC 20515-6001

Dear Chairman Roberts:

CoFARM is a broad based coalition of professional societies whose members are deeply involved in research, teaching , and extension related to agriculture. Our members are involved in academia, industry and government professional activities. Our member societies represent more than 100,000 individuals who have a deep interest in the issues which your committee will consider as it debates the Research Title of the Farm Bill for updating and revision.

Our response to the 57 questions distributed for this purpose is attached. We appreciate the opportunity to respond, even though it is a challenging task. We recognize that you will get a good many responses, and we stand ready to assist with your assessment if that opportunity presents itself. That would include an opportunity to provide testimony if hearings are held.

Our response is complete and, perhaps, lengthy as might be expected for a complex issue. We believe there are few issues which need most focus and of greatest importance for our members who are primarily the doers of science for agriculture. We will point out a few of these in the balance of this cover letter.

First of all, Federal Funds should focus on national needs and research that will not be done by others. In some cases, this is the basic research which can be implemented in specific situations depending on those varying needs. In other cases, it may be applied research that will not be done by industry or others because it is important but not related to a specific product or

Members

American Dairy Science Association · American Institute of Biological Sciences · American Institute of Nutrition · American Phytopathological Society · American Society for Horticultural Science · American Society for Microbiology · American Society of Agricultural Engineers · American Society of Agronomy · American Society of Animal Science · American Society of Plant Physiologists · Crop Science Society of America · Council on Food, Agricultural, and Resource Economics · Federation of American Societies of Food Animal Sciences · Genetics Society of America · Institute of Food Technologists · Poultry Science Association · Rural Sociological Society · Society of Nematologists · Soil Science Society of America · Weed Science Society of America

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technology which produces income to a specific private sponsor. Please understand that state and private funds are greater than Federal funds, but each source contributes to the overall good for citizens of this country because of their complementary results. The agricultural enterprise has provided food and fiber of high quality, abundant and affordable, and in a fashion that is envied around the world. Changes are needed, but they should not destroy, but rather improve the current system.

Secondly, we wish to support a broad Stakeholders Advisory Board to advise the Secretary and Undersecretary for Research, Education, and Economics (REE). Past advisory boards represented various interest groups and their reports were not of great impact. Each interest group is, of course, going to support its efforts. A mechanism to bring all groups together to jointly discuss the needs of their constituents in the presence of others would be a much sounder approach. This mechanism should involve not just doers of research (scientists and the university system) but producers and groups reflecting the interests of societal components that consume the products and care how they are produced. It may be necessary to assist some sub-groups to come together in advance of their participation in the Stakeholders Advisory board so as to reach broader participation.

Thirdly, limited resources require the maximum benefits from any investment. Past investments in agricultural research have yielded returns estimated to be on the order of 30 to 50%, more in some instances. Some part of reductions in commodity support payments, if that occurs, should be allocated to future research investment to ensure competitiveness of our food and fiber systems. This seems to be the intent of the Agricultural Competitiveness Initiative and is a sound approach to the future challenges. In addition, the intramural (ARS and ERS) activities and the extramural (CSREES) activities of USDA / REE need to be coordinated as never before. In the past there has been competition between these programs. Agricultural research needs balance - basic and applied research, biological and social, intramural and extramural, competitive and formula- but most of all it needs to be supportive and not duplicative. Future administrator choices should ensure this goal, intent of this could be reflected in the Research Title.

Thank you for this opportunity to respond. We appreciate the seriousness with which you and your committee are undertaking these considerations. These comments were discussed by all of our active members. The responses are specifically endorsed by those member societies listed below.

Sincerely yours,

Robert G. Zimbelman
Chair, CoFARM

cc: John Goldberg

Endorsing Societies
- American Dairy Science Association
- American Institute of Biological Sciences
- American Institute of Nutrition
- American Phytopathological Society
- American Society of Agronomy
- American Society of Animal Science
- American Society of Agricultural Engineers
- American Society for Microbiology
- American Society of Plant Physiologists
- Crop Science Society of America
- Council on Food, Agricultural, and Resource Economics
- Federation of American Societies of Food Animal Sciences
- Institute of Food Technologists
- Poultry Science Association
- Society of Nematologists
- Soil Science Society of America

AGRICULTURAL RESEARCH, EDUCATION, & EXTENSION
QUESTIONS FOR DISCUSSION

Responses from the Coalition for Funding Agricultural Research Missions (CoFARM)

I. Federal agriculture research goals

1. What should be the role of the Federal Government in agricultural research?

In agricultural research, the Federal Government should coordinate and fund programs in support of the following general goals:

- To assure the safety and security of the nation's food and fiber supply;
- To enable competitiveness in the global agricultural markets;
- To improve environmental and natural resource conservation.

The roles of the Federal Government, in order of priority should be:
A. Assure continued expansion of the knowledge base and understanding of agriculturally important organisms, processes and systems and of the environment and natural resource base upon which agriculture (and life) depends. The knowledge comes from many types of research and remains in the public domain for the public good.

B. Provide a national agricultural research infrastructure, including funds for intramural and cooperative (formula-funded) mission-linked research, a strategic network of facilities and equipment, and an educational system that assures an adequately-trained work-force and a public increasingly literate in science, food, agriculture, and natural resources.

C. Provide national leadership for the policies surrounding agricultural research, including funds to facilitate and stimulate cooperative regional and national research programs.

2. To what extent should goal setting and goals in agricultural research be cognizant of and coordinated with research activities in the rest of the Federal research sector (HHS, EPA, DOE, etc.)?

The federal investment in agricultural research, at about $1.4 billion annually, is less than 5% of the total annual Federal investment in nonmilitary research. The USDA as well as other agencies must be cognizant of potential overlaps and areas of shared interest with other mission agencies and their activities, as well as those of the basic research agencies. Mechanisms for coordination to avoid duplication are in place, in many cases. For example, human nutrition research and animal research carried out or funded extramurally by HHS has a focus on the relation of diets and nutrition on managing, preventing, or curing diseases, whereas USDA is the lead agency in research on appropriate foods to assure well-nourished people of all ages and health status. With animals, USDA funds research related to improving growth, reproductive efficiency, animal health and well-being, and animal genome research must be coordinated with HHS research that may use animals as models for research on human diseases. The USDA also shares areas of research with DOE, for example photosynthesis as an agriculturally important biological process and as a potentially renewable energy source. Other shared research areas include, with EPA, environmental effects of pesticides and global change research; and with NSF, plant and microbial science and ecosystems research.

3. Is the process associated with the Food Animal Integrated Research for 1995 (FAIR '95) adequate for the development of Federal agriculture research goals? Are there goal identification processes which might better serve to enhance Federal agricultural research other than FAIR '95?

The Fair '95 process is a useful model for developing goals for all agricultural research in the sense that it involved all stakeholders and was then endorsed by them. The adequacy could be questioned, however, particularly relative to basic scientific knowledge. It was not intended to cover all of agriculture, but goals are pertinent more broadly in some instances.

4. If the process of FAIR '95 were to be used to adopt an agenda for Federal agricultural research, how would the goals identified in FAIR '95 and listed below, need to be modified to address the concerns of all research stakeholders?
1) Enhance industrywide responsiveness to consumer and societal concerns;
2) Meet market demands through increased efficiency and competitiveness;
3) Develop integrated food animal management systems;
4) Maintain and enhance environmental quality;
5) Improve food quality control in terms of safety, desirability, and nutritional composition; and
6) Enhance animal well-being throughout the life cycle of food-producing animals.

The above goals begin with responsiveness to consumer and societal concerns, a goal which certainly applies across the board. The second demonstrates the need to continue on efficiency and competitiveness; factors which can no longer be the only focus, but must share the agenda. The third, fourth, and fifth goals cover current societal goals that impact both plant and animal agriculture and the wording could be modified slightly by adding plant and microbial systems so as to broaden the coverage. The sixth and final goal on animal well-being is obviously oriented toward animal agriculture but is in line with current societal interest in concern for how animals that produce food are raised and processed. It seems likely that a slightly modified set of goals could be derived to include plant agriculture, microbes, and social issues in a broader context of these FAIR '95 concepts.

II. Priority Setting

5. Is Federally funded agricultural research focused on the issues of highest priority for producers, processors, and consumers? If not, how can the priority setting mechanism be improved to insure that these issues are addressed?

Not necessarily. Previous attempts by the USDA (ARS and CSRS) to set research priorities are viewed by us as unproductive exercises. When all potential areas of research are considered, each tend to find their way into some comprehensive list of vitally important priorities. Therefore, lists resulting from these priority setting exercises are meaningless for policymakers in allocating resources. Based on the local/regional nature of many agricultural issues, this lack of priority specificity is predictable. Most priority setting simply amounts to repackaging the existing R&D portfolio without any substantial redirection of funds. Priority setting should be flexible, have a broad-base, enable long-term and high-risk work, and reflect national as well as international needs. However, the process should also recognize that priorities may be implemented and supplemented to reflect the specific priorities for local or regional needs.

Therefore, we recommend that rather than develop a set of predetermined research priorities, the Congress and the USDA should establish a set of priority performance standards that set funding parameters for federally supported research. For example, performance standards such as the following should be considered:

- Increases the amount and quality of science applied to solve problems facing agriculture and forestry;
- Supports the training of new scientists and the retraining and/or continuing education of scientists, teachers, and agricultural professionals;
- Assures that U.S. world leadership in science and engineering includes areas of science and engineering relevant to agriculture, food, fiber, and the environment;
- Responds to new emerging or reemerging agricultural problems or priorities; and
- Strengthens the agricultural research enterprise.

Specifically federal policymakers (in an interagency/interprogram context) could help ensure that agricultural research programs address performance standards by structuring programs to meet a set of program parameters that ascribe to the following:

- Research programs are designed to provide knowledge that can be used to address issues and problems deemed important at local, as well as global, levels;
- Research programs should be rigorously and uncompromisingly peer reviewed, whether funded competitively; or through special grants; or distributed as formula or intramural funds; and, whether the research is fundamental or mission-oriented.

If these are adhered to, the USDA research portfolio will be responsive to the needs of its stakeholders, be of high quality, innovative, and meaningful regardless of the percent of research allocated by the various funding mechanisms.

6. Should Federally funded agricultural research address specific technological and industrial needs? If yes, does the present system fulfill this goal (if not, please describe how this can best be accomplished)?

As a general rule, we believe that research that benefits only the state or local industry or consumer interest group should be paid for by that commodity, state, industry, or group. Federal investment should assure the widest possible benefit to the American public for the public good, thus it should not necessarily address specific technological and industrial needs. It should, however, address those needs that are in the national interest but are not likely to be addressed by private industry. For example niche markets for using pest-, crop-, and often environment-specific products are of little interest to larger industries because of low potential markets, and thus profits.

To a large extent the present system addresses specific needs of agriculture. The USDA's National Research Initiative Competitive Grants Program (NRICGP) follows the approach of setting broadly defined national priorities including knowledge generation, developing a broad program description, and calling for proposals which are then funded at specific locations. The USDA's ARS intramural programs and formula funded programs of CSREES -- the infrastructure of agricultural research-- are both responsive to technical and industry needs. The planning, conducting, and reporting of the actual research at local and regional levels, but in support of national priorities should be (and is) the responsibilitiy of state and federal scientists hired to conduct research.

7. Does Federal agricultural research adequately address projects that result in quantum leaps in benefits, or does it dwell too much on incremental benefits?

The Federal investment should be used, as much as possible, in support of fundamental research because it gives new understanding of mechanisms and principles and opens new directions for applied research. Research, by its very nature, is slow and incremental. Only a rare few research projects can be expected to result in a major discovery of "quantum leap", and these are impossible to predict. Even with breakthroughs, it can take years or decades to apply the new discovery to that segment of the vast agriculture food, feed and fiber sector or the environment sector. We believe that a major Federal role must be to assure continued expansion of the knowledge base and understanding of agriculturally important organisms, processes, systems, and the environment and natural resource bases upon which agriculture and society depend. Benefits will then come by both incremental and quantum leaps and often from unexpected sources.

8. What is the appropriate role for USDA/REE in insuring competitiveness in the face of decreases in price support programs?

The USDA/REE role is synonymous with that of the Federal government, namely to: (i)assure a continued expansion of the knowledge base and understanding of agriculturally important organisms, processes, systems, and of the environment and natural resources upon which agriculture depends; (ii) provide a national agricultural research infrastructure; and (iii) provide national leadership for agricultural research. Insuring competitiveness will depend on the ability of agricultural industries to: (i) develop less expensive and more socially-acceptable ways to farm; (ii) increase production per unit of land or animal; and (iii) to protect or enhance soil, water, genetic and other natural resources upon which agriculture depends. These are precisely the same fronts upon which progress was needed (and made) to enable movement from subsistence agriculture.

Insured competiveness for farmers may also take the form of new crops that provide alternatives to crops now under price support programs, of value-added products from the currently-grown crops, or of changes in farming systems . As one example of the latter, farmers are changing from conventional clean tillage crop systems to no-till conservation farming systems. Costs are decreased, yield potentials are raised, moisture is conserved, and soil and soil quality are protected, all of which have the potential to enhance competitiveness over the long term. However, under the different farming systems, there is significant potential for new or re-emerging disease and pest problems. Knowledge of the organisms is necessary to maintain profitability and requires research into understanding the mechanisms underlying their emergence. New sources of plant genetic resistance, new pesticides and biological control agents must be discovered and developed for their management, all of which underlies the need for investment in research.

USDA/REE should recognize the need for research before either of these approaches can be profitible, since the inevitable change in farming systems will require research on improving genetic resources, as well as understanding disease and pest pressures and approaches to their management.

9. How can the appropriate Federal-State-Industry resource pools be integrated to develop high priority regional programs in research, teaching, and extension?

Program development at the local or regional level, must be facilitated through leadership, infrastructure, and some funding at the Federal level. Programs should be encouraged to be truly regional and not just for the benefit of the state or locality in which the work is done. The environment provided by the Federal infrastructure should be inviting to local development of high-priority regional programs and should include a mechanism for supporting regional cooperative projects, providing facilities in accordance with regional needs, and providing for the participation of Federal (ARS) and state scientists supported by base and formula funds in a cooperative manner.

Plans must be integrated to include both fundamental and applied research needs. as well as to provide for education and technology transfer over a long term. Fundamental research, since it is more conceptual and intended to add to the knowledge base available to agriculture more generally, can be submitted for competitive funding by the NRICGP. The more applied research can be funded by growers through their commodity check-off funds and by private industry that stands to gain in providing goods and services. State appropriations and formula funds provided through CSREES to land grant universities, including regional research funding, contribute by way of salaries and base funds for state experiment station researchers and extension specialists. ARS scientists also work regionally and are accountable to national priorities.

10. How important is the Federal agricultural research role in supporting other agencies of USDA? Of other Federal agencies? Could this be done more efficiently and at lower cost?

Research results obtained through federally-funded agricultural research provide for science-based decisions and policy by USDA action agencies, including the Animal and Plant Health Inspection Service (APHIS), the National Resources Conservation Service (NRCS), the Federal Grain Inspection Service (FGIS), the Food Safety Inspection Service (FSIS), and the Agricultural Marketing Service (AMS). Results are also used by other federal agencies, including the Environmental Protection Agency, the Food and Drug Administration, and the United States Geological Survey. Scientists within USDA research agencies are currently directed to do this type of supportive research. It is possible that, for certain types of research, peer-reviewed, competitive approaches may increase efficiency and reduce cost without loss of quality.

11. USDA reorganization created the Cooperative State Research, Extension, and Education Service (CSREES). In your opinion, how should this newly configured agency function to support the U.S. agricultural enterprise, 1995-2002?

The focus of CSREES research must be on the same three major goals of the Federal government in agricultural research (See response to question 1). It should assure continued expansion of the knowledge base through extramural research by funding only the most meritorious, investigator-initiated research consistent with broadly-defined national priorities through the NRICGP. It should provide the national agricultural research and extension infrastructure through coordinating the formula funds to land grant university and agricultural experiment station partners and the cooperative regional research funds, and it should contribute to funding of regional facilities in support of regional and national priorities. CSREES should play a key leadership role in working with university partners to plan university-based agricultural research that meets the needs of local producers, processors, and consumers and also supports national priorities. The public (producers and consumers) should define their needs, but the scientists and engineers should decide on the proposals most likely to contribute progress through the peer-review process.

The Extension and Education components of CSREES are critical to the agricultural infrastructure, and are key to transferring technology and training the human resources required for the entire U.S. agricultural enterprise in the future from the standpoint of both the producer and the consumer. The educational component should be expanded to address K-16 and continuing education needs of the agricultural professional work force.

12. What is the proper place for integrated systems programs? What role should the Extension Service (extension functions within CSREES) play in these programs?

Integrated systems programs should continue to involve research and education directed toward understanding and managing the many interactive components that make up an entire "system". This might include interactions of fields in farms making up a watershed or agroecosystem, the production, processing, and distribution of an agricultural product; or the many factors needed to understand and successfully manage no-till cereal-based agriculture, as examples. Integrated pest management (IPM) also involves the integration of many systems which, like most systems, occurs at the local and regional levels with involvement of local and regional stakeholders, researchers, and extension agents. Integrated Resource Management projects for animals include not only production efficiency but integrates issues of animal health, economics, environmental concerns, and animal care considerations among other items. The role of CSREES is to help provide the national agricultural research, extension, and educational infrastructure as well as national leadership and some level of funding, to facilitate integrated systems research in support of national priorities.

However, systems approaches will not necessarily be a panacea for all of agriculture. They must be accompanied by critical thinking and by alternative, individual approaches. Thus the role of extension is even more critical in support of systems research, as we explain further in the response to question 44.

III. Advisory Boards

13. Have USDA's research and extension advisory and coordinating boards been effective in planning and prioritizing agricultural research and extension? (please explain)

The USDA advisory boards have allowed broad participation by a number of interest groups. There are advisory boards that tend to have oversight of all categories of research. They have been established along lines of discipline or areas of research rather than at a level to look at a whole system. The agricultural industry is a group of systems. Advisory boards need to work at the systems level as well as to help influence research, education, and extension to operate in a seamless manner at the whole system level. It appears to us that better linkage of the grassroots stakeholders with the scientific community, particularly in regard to any feedback or involvement of the professional scientific and educational societies and their consortia, would greatly enhance the relevance of the priorities to the state-of-the-art within scientific disciplines.

14. How have research or extension priorities been changed as a result of the recommendations of advisory boards (please provide examples)? Are there presently too many advisory boards?

A multitude of advisory boards will never be effective in reaching consensus on priorities for research and extension. There should be a single Stakeholders Advisory Board for USDA/REE that brings varied interests to the same table. Special interest groups naturally promote their own cause to the exclusion of other interests. A group that is not "at the table" will not be represented, and one that is will tend to have increasing visibility among the priorities. As an example, environmental concerns have become routine components of the thought process in developing agricultural programs and solving problems, which we believe to have been a positive response to local, state, national and international concerns raised by environmental action groups as they became members of advisory boards.

15. What options should Congress consider to improve USDA's process for planning and prioritizing agricultural research? (i.e. how should the research agenda be prioritized?)

Congress should provide a mechanism that facilitates the planning and prioritization of agricultural research at all levels. The USDA should set goals that complement local planning and prioritization so that the national goals of increasing understanding and knowledge are fulfilled and that the production programs including urban plant production and wood/fiber production are all integrated into larger ecosystems. Goals at the federal level should be to maintain a balance of long term, basic and applied research with shorter term maintenance activities, and to maintain a productive, modern national and state infrastructure that includes national leadership, funding, facilities, and a scientific/support workforce. As in the response to question 13, closer cooperation of USDA with the agricultural and biological scientific societies should be considered in planning for agricultural research.

16. What role should stakeholder advisory boards play in setting the agenda? What groupings should be represented on advisory boards? Can "customers" and "partners" be accommodated on one board or will it require two?

Stakeholders at the local level should help set local priorities to satisfy local needs. These local priorities should include a balance of long-term and short-term, basic and applied goals. Federal level stakeholder advisory boards are needed to provide oversight to assure good balance and that local priorities do not neglect the total sustainable environmental system while focusing on local needs.

The clients of the agriculture industry include all citizens of the state, nation and world because of the universal requirement for food, clothing, and shelter. Government funding will not be adequate to support all of the needed research and education functions. Thus it is imperative that all stakeholders, customers and partners, agriculturalists, and scientists representing biological and social scientific societies across several disciplines be included as members of an advisory board. This approach allows for better understanding of each group by the other and could be accommodated on a single board. Interagency boards might also be considered for certain areas of science.

17. Is there a special role for advisory boards to play in international agriculture beyond what has occurred in the past?

Advisory boards must consider international commerce, trade, and agriculture because agriculture and forestry are more directly impacted by international events with the advent of GATT and NAFTA. All advisory boards must operate with an understanding of the world situation rather than only a local, state or national perspective. It might be of value to have, as part of all national advisory boards, international experts as observers.

IV. Funding considerations

18. What is the most appropriate mix of Federally funded basic and applied agricultural research?

The federal government should fund primarily basic research, but it should also aid in the funding of applied research unlikely to be funded by the private sector and where the research will meet the needs of action agencies, lead to the development of new agricultural practices, and to solve regional and long-term problems unlikely to be solved by the research at any one state. This is consistent with the Federal role of assuring a continued expansion of the knowledge base available to solve problems in agriculture, including forestry, and social and economic issues. This is also consistent with the principle that research funded by the Federal government should be of benefit to more than the state or organization where the research is done; such research will naturally be more conceptual in nature and by inference more basic than applied.

19. How, if at all, can the effectiveness and efficiency of agricultural research be enhanced at current funding levels? At reduced funding levels?

The effectiveness of agricultural research can be enhanced at either current or reduced funding levels by providing funds to the projects of greatest merit based on scientific quality and relevance to the needs of the agriculture as determined by peer review. Peer review should be conducted regardless of funding mechanism, including intramural, special, and formula, as well as competitive programs. In addition, federal funding for more applied research could be used to facilitate or stimulate more multidisciplinary research and cost-sharing by local and regional stakeholders, including the private sector.

20. How can future funding be determined and justified so as to permit multi-year programs to be completed?

The need for long-term research is particularly critical to agricultural and forestry research, and can be justified on both scientific and biological bases. In genetic studies and crop/species development, individuals may have a long lifetime, such as trees. For many, there is a need for multiple generations in genetic studies and for observations over multiple growing seasons. Multi-year programs are particularly important in systems research which by its nature takes a long time. Agriculture also has a need for continuous maintenance research with major and minor crops or species that do not receive funding from industry.

Multiyear programs are currently permitted by the funding provided for the intramural research carried out by the Agricultural Research Service, the Economic Research Service, and the Forest Service. Formula funds and special grants, while dependent on annual appropriations, have mechanisms within the USDA infrastructure to carry out projects of five-year duration and, with renewals, for up to fifteen years. In addition, the NRICGP is authorized to fund projects for up to five years, but few projects are funded for this duration because of limited funds and the mandate to fund the widest participation from the scientific community.

In the past such long-term programs have been covered, albiet meagerly, by formula funds and by intramural funds. With down-sizing at the State as well as Federal levels, the current funding is insufficient and many long-term, valuable programs have been lost. Clearly, new fiscal mechanisms for multiyear research programs, and for dispersion of major equipment costs over several years, should be considered. In practice, it may be necessary to establish a system of peer-reviewed projects, funded by formula funding, that permits and encourages long-term projects.

21. In view of the growing emphasis on greater accountability of Federal expenditures, do you have any suggestions as to how agricultural research results can be measured and their impact evaluated? Is there some standard of accountability for the efficient and effective use of Federal research funds?

Agricultural research continues to be viewed as having one of the best returns on investment of the Federal dollar, as discussed in the 1995 CoFarm publication entitled "Investing in Agricultural Research -- A Critical Link to Prosperity in the 21st Century". The agricultural industry generates $902.5 billion, or 14.2 % of the gross domestic product, yet the total research budget of USDA CSREES, ERS, NASS, and ARS is only about $1.7 billion.

The impact of agricultural research can also be measured as outcomes, including, as examples: (i) the status of the United States as a world leader in areas of science and engineering relevant to the agriculture, food, and renewable resources; (ii) an infrastructure with the ability to respond to and solve new and emerging problems, such as the 1970 southern corn leaf blight epidemic and the new epidemics of the 1990's; and (iii) the ability of the agricultural sciences to attract, train, and support (at limited levels) young investigators.

A widely accepted standard of accountability of public-funded research is that the information is published, a measure of scientific quality and acceptability since it is then available for wide dissemination to the consuming publics. Many industries rely heavily upon and use the results of agricultural research. Consumers respond to new products developed in response to a desire, such as development of seedless grapes and other products of desired quality. Information that is published can be related to the amount of technology transferred to the agricultural industry.

22. What is the proper balance between in-house, formula funds, competitive grants, and special grants?

Each of these types of funds serves a different purpose and should be maintained in a balance provided quality is assured. Special grants could be reduced provided operational dollars were available to scientists from formula funds. However, the practice of using formula funds for salary dollars has become commonplace in many Land Grant Universities and of course is the rule in the USDA intramural research program. This would greatly reduce the research work force, and weaken the infrastructure because fewer researchers would be there to apply for grants. There needs to be flexibility within the system to address new biological problems that continually arise within agriculture, which may not be the case if funding were not balanced and special grants were to be eliminated.

23. What guidelines should be used in determining appropriations for "specified programs" in research, education, and extension?

First of all, there should be broad agreement from stakeholders that there is a need for the "specified program", especially as an emergency need, such as a new or reemerging disease of an agricultural species. Proposals to conduct research on the problem should be judged by peer review, as a guiding principle. If the potential recipient(s) does not provide a suitable, peer-review acceptable, plan of research, proposals from other qualified scientists should be sought and peer reviewed accordingly.

24. Should Federal funds be used for programs only, or for facilities as well? If for facilities, how should they be allotted - competitive proposals or other? Is there a place for regionalizing research, increasing competitive grants, etc.?

Facilities should be supported on a limited scale, with allocation based on competitive merit, and regionalized wherever practical and appropriate.

25. Is there a place for partnerships not only with state and local public sector organizations and industry; but also with private foundations?

Yes, but such partnerships would have to be within the limitations of the charter of each of the private foundations. Care should be taken to resolve, in advance, potential conflicts of interest and the need for an unbiased approach to information development and dissemination to the benefit of the public.

26. To what extent do self-assessed "check-off" fees on commodities provide resources for research and education? Do these/should these programs support long-term research, as opposed to short-term product development and promotion

research?

In principle, commodity funds should be made available for support of long-term research, but should not be expected to substitute for Federal research. In practice, they are often for short-term projects and must be awarded on an annual basis. Commodity boards often emphasize promotion and marketing to make the commodity more competitive. Production research has a lower priority and is usually funded at a lower level. The support of research to generate knowledge about the commodity is often minimal, and few funds are provided for education. Check-off funds should be flexible at the discretion of the producer boards that control them, but these boards should be cognizant of what research can do for the commodity.

Only large crops will generate enough "check-off" dollars to fund a significant amout of research. New or low volume crops will never generate enough, thus a catch-22 situation readily results. The commodity will not grow without research, yet its check-off funds will not be sufficient to fund research needed for it to increase. Sufficient crop will never be produced to develop and satisfy a market.

V. Delivering agricultural research

27. In order of priority, what would be the most significant actions USDA could take to improve its management and/or delivery of agricultural research?

Management of research:
1. Streamline and simplify the administration and management .
2. Improve interactions between ARS and CSREES, as well as between them and other research agencies such as the Economic Research Service and the National Agricultural Statistical Service. The recent reorganization of USDA to combine the former ES and CSRS activities has the promise of improving these relationships.
3. Improve interactions between regulatory arms of USDA and Federal research.
4. Develop a better reporting system to reflect efforts expended and results obtained.

Delivery of research:
1. Establish a system to maximize the use of the ever-reducing number of extension personnel, through interaction and regionalization.
2. Participate in the privatization of agricultural and natural resource management information delivery systems to end users by providing national leadership and coordination as well as the development of model systems.
3. Minimize competition between Federal-supported information delivery systems with private enterprise.

28. What options should Congress consider to improve the delivery, results, and benefits of Federally funded agricultural research?

Recent actions by Congress that have been helpful include Phase III of AARC that enables commercialization of products coming from ARS, and the Small Business Innovative Research program, since it is a peer-reviewed program. Both encourage the delivery into the private sector of research results from Federally funded agricultural research with potential economic benefit. Congress should continue to work on harmonizing international activities to result in agreements that are not discriminatory toward American agriculture. Bringing new products to market has been improved through, for example, improved transfer of Intellectual Property Rights and Technology Transfer agreements. Both Acts need to be streamlined to avoid prohibitive initial costs. The Federal government could provide both financial and technical supports, and should consider legislation similar to the Orphan Drug Act for new products with small markets.

29. What should be the Federal role in insuring training of future work forces for food and fiber needs as well as the natural resource concerns of the public?

A major role is in training the scientific work force that will continue to generate new knowledge for the scientific enterprise of agriculture. Federal grants should include funding to hire and train postdocs and grad students to work in the labs of senior research investigators. This should include research on practices for agricultural production as well as for food handling and natural resource concerns.

A large percentage of the work force deals with agriculture in some way, necessitating the use of multiple approaches, including the continuing education. For example, the Federal role could be to stimulate privatization of the agricultural professions to ensure that a job market will develop for private agricultural professionals (consultants, distributor representatives, manufacturers representatives), which in turn will attract students to university programs and allow retraining of scientists to the applied profession. Training the food and fiber work forces should focus on K-16, rather than be restricted to higher education.

VI. Land Grant Universities

30. What is the continuing role of Land Grant Universities? 1890's Colleges? 1994 Colleges?

The role of land grant Universities and Colleges will continue to be primarily education. Land Grant Universities should also continue to be research universities and provide the primary vehicle for generating basic and applied research and education in agriculture and natural resources. There is a continuing need for agricultural research in the Land Grant Universities as a part of the university-based research system in all disciplines, with an increased emphasis on interdisciplinary research. Faculty positions and salaries, as well as their facilities, represent expenditures of formula funds that are heavily augmented by state and private funds to develop and maintain this valuable infrastructure, as well as by grant funds generated by faculty.

The 1862 Land Grant Universities should continue to focus on providing education and research contributing to the quality of life in the nation as well as in their respective states. The 1890 and 1994 Land Grant Colleges bring a rich cultural perspective to the solation of many problems of rural as well as urban societies. Both systems are essential to agricultural research and extension and to the education of future researchers, the work force for a competitive agricultural industry, and for assuring a knowledge base for food security and informed management of natural and human resources.

31. Is the current formula used for allocating Federal funds to land grant universities fair, reasonable, and does it address changing conditions? If not, how could it be improved?

The formula used for allocating Federal funds to land grant universities has not changed for many years and thus has not addressed changing conditions, mainly that of change in the structure of farms. A revision is needed that reflects the size and complexity of the agricultural enterprise of the state, the natural resource management issues for the state and region, and the commitment of the state's land grant university to agricultural as well as human and natural resource issues. Any changes toward more equitable distribution should be studied thoroughly by scientists as well as research administrators.

32. The land grant universities have a system of agricultural experiment stations in each state. In today's environment of Federal and State fiscal constraints, is such an extensive system of research stations still warranted (please explain)? Could certain functions be merged with other USDA agencies, other Federal agencies, etc.?

An extensive system of "agricultural experiment stations" is needed for certain programs because of the complexity and the site-specific requirements of applied research, whether or not it is connected to the land-grant university. The network of stations is needed that will not be duplicated by the private sector. On-site support for the commodity, reaction with local clientele, and site-specific environmental conditions can be invaluable.

The term experiment station, although it has been used since the original enabling legislation for land grant universities, is not reflective of the current activities in each state since many experiment station personnel are primarily conducting basic research on main campuses. Mergers of research stations within a state could and have been considered, and probably should be in the future as well. Mergers between states have been discussed by groups of Experiment Station Directors and other USDA agencies, and should be encouraged. It should be accomplished in a manner which permits state ownership of such cooperative ventures.

33. How can agriculture research be best coordinated among Federal, State, and private institutions?

There may be no one BEST system for coordination of agriculture research among Federal, State and private institutions. In an enterprise as complex as the agricultural system, with its many biological species, their interactions in localized environments and potential global effects, there is room both for a highly pluralistic system, as well as a highly structured system of coordination. Electronic communications among researchers, as well as research administrators and funders of research, has the potential to revolutionize this area in the future.

34. What models currently exist, and are in use to provide regional cooperation in research and extension?

USDA has long had systems for regional cooperation in research in the ARS intramural programs and within the Experiment Station system. The myriad of problems, often locally or regionally specific, has fostered the development of clusters of researchers focused on common problems throughout a region, ecosystem, or watershed, or on common species or farming systems. The coordination of these groups has often been through the Regional Research Fund program and/or the Special Grant Fund system. However, the funding management has not placed dollars in the hands of the research scientists. The national and regional/sectional meetings organized by scientific societies provide opportunities for interchange of information often leading to collaborative research and are to be encouraged.

35. In the current era of constrained resources, is it appropriate to use Federal funds to promote cooperative regional research to reduce unnecessary duplication; and to what extent is it appropriate to use Federal funds to encourage consortia of states to establish individual centers of excellence to address common problems?

Cooperative regional research is not always done to reduce unnecessary duplication. Cooperative regional research also enables expertise of faculty researchers from other state or Federal labs to be applied in regions where no researchers have the capability of addressing the problems. Furthermore, the scientific method of publication of results and peer review are tremendously effective in eliminating duplication of effort. Scientists will not embark on or recommend funding for research if results have already been accomplished, unless there are site-specific reasons for revalidating them.

The role of Federal government should be to assure a high quality of science, and to facilitate and simplify the procedure for seamless interaction between scientists at different locations funded from a variety of sources. Cooperative research is likely to be the rule in the future to enhance overall effectiveness of research. Coordination should be provided by state/federal cooperation, with clusters of federal researchers located at regional laboratories participating fully in the system.

36. As societal concerns about natural resource use, rural development, animal well being, etc. are integrated into the USDA agenda, is there a role for "new" partnerships with the Federal sector?

Yes. New partnerships could undoubtedly be identified with Federal sectors, but not without a full understanding of the extant partnerships. A well-balanced Stakeholders Advisory Board would be useful for such considerations.

37. Other parts of the Federal Government sponsor research directly applicable to the food and agriculture system. The National Science and Technology Council is intended to address the coordination of related activities across agencies. How is this intended to work in the case of research and extension on food and agriculture? How well is it actually working? Are alternative methods needed?

The National Science and Technology Council, although relatively new, has proven to be a promising mechanism by which to address coordination of related activities applicable to the food and agriculture system. Unfortunately, research and extension on something as vital as a safe, high-quality food supply produced at a minimal cost to natural resources has not been a very visible component of NSTC consideration.

For example, the USDA's efforts in fundamental research supported through the National Research Initiative can be coordinated and experiences shared within the NSTC Committee on Fundamental Science. USDA research on the environment and natural renewable resources is coordinated with related efforts of other mission agencies within the NSTC Committee on Natural Resources and The Environment. USDA efforts in research on food safety and security together with NIH research on human health issues are major aspects of the NSTC Committee on Health, Safety, and Food.
In these times of budget constraints, the NSTC should be allowed to function and mature as a coordinating council and forum for interchange within the multiple mission areas of the federal government that support research.

VII. National Research Initiative

38. Congress authorized the National Research Initiative (NRI) Competitive Grants Program at $500 million per year. If the NRI is to be fully funded, where in the USDA research budget could money be transferred from?

The NRI opened up agricultural research potential to the U.S. scientific community and has been a catalyst for basic and applied research, which we strongly support. It has developed an outstanding program open to all U.S. scientists, but is severely limited by inadequate funding. In seeking sources to fund it fully, however, it is important to take into consideration the need to balance support between infrastructure (the scientific workforce, some base funds, and facilities) and support for competitive grants. The options for funding presented in the National Academy of Sciences report calling for the establishment of the NRI should be considered seriously by Congress, since the rationale presented therein remains valid.

Within the current USDA research budget, funds should not be transferred from intramural research or from research partnerships with states funded by formula funds. Thus special funds appear to be the most likely source for some of the needed dollars. Realistically, however, the total amount of funds needed for the NRI is simply **not** in the USDA research budget. Since food and natural resources are of interest to every American, transfer to USDA of new funds for research is highly appropriate even in the current environment of budget cuts. Savings from federal price support programs, as proposed in the Agricultural Competitiveness Initiative, would be wisely spent if invested in federal agricultural research programs (see # 39).

39. What other options for funding the NRI should Congress consider?

A. If proposals to reduce commodity price supports were implemented, transfer of funds to research can be justified on the basis that additional research will be needed to provide new technology to reduce risks and help farmers remain competitive without price supports.
B. If proposals to cut conservation payments to farmers were implemented, there would be a greater need to provide technology for farming methods that protect the environment, wildlife habitat, and the natural renewable resource base upon which agriculture depends. Return of some of those dollars to fund research is also justifiable.
C. A viable agricultural system is vital to the defense of the nation. Therefore, Congress should also consider research funds from the Department of Defense for funding the NRI.

40. Have NRI appropriations been used to expand agricultural research or have they been used to continue existing programs?

The NRI appropriation has been used to expand agricultural research in at least three ways. First, the NRI, by its mandate to support the widest participation of U.S. scientists, has considered funding of proposals from outstanding scientists outside the traditional agricultural experiment station system. Second, grants provided to the core agricultural scientific workforce represented by agricultural experiment station and Agricultural Research Service scientists has allowed these programs to do more research through the inclusion of post-doctoral associates and graduate students. These groups receive nearly half of the NRI funds, based entirely on the merits of the proposed research as evaluated by scientific peers. Third, the NRI has funded new areas of research such as agricultural systems research and ecosystems research.

VIII. Agricultural Research Service (ARS) Laboratories

41. Should the USDA have research laboratories or should it provide competitive funding to existing entities such as universities?

There should be USDA laboratories to cover areas that are of nation-wide interest and need which complement university research. Product utilization labs are an example. USDA labs could continue to be involved in very basic research that underpins the more applied work at outlying research centers, be they Federal or university operated. Peer review, preferable by sources external to ARS scientists, should be a part of the process in a manner analogous to review by NRICGP panels.

42. Should more ARS laboratories be co-located at land grant universities? What should be the relationship between ARS and land grant university scientists? Between ARS research coordination? How can ARS laboratory functions be more effectively linked to State Agricultural Experiment Stations?

Certainly some of the very best ARS research has been and continues to be conducted by scientists housed on land grant university campuses. The physical location of the ARS scientists allows for maximum interaction with university scientists such that the outcome is greater than the parts. For example, the ARS corn genetics program at Iowa State University, in cooperation with the university scientists has developed and released corn germplasm lines (eg. B73) from which varieties have been developed that are grown on millions of acres world-wide.

When ARS scientists are located on land grant university campuses, there should be a close relationship, both physically and administratively, with their university counterparts such that the ARS scientists are made to feel as faculty members and fully participate in university activities, including interaction with students, and in professional society activities. ARS laboratory functions are most effective when they are housed in the same university buildings with university scientists so that both can benefit from mutual sharing of equipment, expertise, and ideas. This is currently true at many locations. For example, the ARS Photosynthesis Unit at the University of Illinois is physically and administratively integrated with the University's effort combining to create the foremost program in the world in this fundamental area of agricultural research.

43. Are ARS laboratory facilities effectively used in performing needed research? If not, please explain and offer suggestions for better use?

This very much depends on the facility. As one example, the Plant Gene Expression center at Albany CA is a good model of how a Federal investment in intramural research can be effective and perform needed research in the national interest. It is a separate facility, yet is effectively linked to a University - UC Berkeley.

IX. Extension Service (Extension functions within CSREES)

44. The USDA Extension Service's (ES) mission is, among other things, to disseminate research results to farmers and other customers. In your opinion, is the ES effective in carrying out this mission? (please explain)

In general, we feel that the ES is effective in facilitating the dissemination of research to its customers. However there are many other avenues by which farmers are obtaining research results including private consultants, private companies, trade magazines, etc. Perhaps the most significant role that ES plays is the timely dissemination of results, since ES personal are generally closer to the source of information. Electronic communications may change this. In the future ES could provide more continuing education opportunities for private consultants and industry, as well as media representatives. Above all, ES should not be duplicating (and competing with) these avenues, except to assure the most current research results are disseminated.

The provision of extension services to producers by multidisciplinary teams is needed more than ever with an increasing focus on whole systems. New approaches to producing food while considering various societal issues, such as environmental impact, cannot be fulfilled by private industry sources.

45. Should the ES be involved in addressing the problems and challenges confronting urban populations?

The ES should be involved in addressing urban problems and challenges if the issues are consistent with its support of agricultural missions as, for example, food safety and distribution, human nutrition, and the health and well-being of amenity (non-food) crops and species important to the urban population. The expertise of ES may help bring new and novel solutions to these and other urban problems and challenges. For those areas not related to the agricultural mission, USDA should not be the lead agency but should cooperate and support efforts of those agencies having programs specifically addressing these issues for urban populations.

Currently, urban populations probably utilize the ES more than do rural populations. If the ES does not continue to be involved in this area, it forgoes the opportunity to increase its customer base, which is likely to perpetuate the erosion of funds from state and Federal legislatures despite the fact that the service it performs is widely valued.

46. What, if any, role should ES play in dealing with the social issues facing farmers and rural communities?

Certain issues and problems of a social nature can be part of the larger problems facing rural America. The ES has made some effort to address social issues such as rural mental health, family stability, and economic viability of small towns, because they directly influence the competitiveness of American agriculture. The ES should carefully consider its role relative to what it can offer so that its efforts complement those offered by other agencies. The ES should aid in social issues primarily in areas consistent with its support of agricultural producers and the social problems they encounter during transition to new and novel production systems.

47. Should the ES's mission statement be changed to focus activities on production agriculture?

The mission of ES, as a part of CSREES, should remain focused on the food and agricultural sciences and related environmental and human sciences to benefit people, communities and the Nation. The ES should focus on production agriculture in the holistic sense. Thus it should consider efficiency, sustainability, and efficient use of natural resources, and not just on maximizing production from agriculture.

48. What should ES not be involved in?

The ES should not be involved in issues that impact all of society and for which other Federal or other agencies have mandated and effective programs. The original strength of the ES is in providing education, which it should do increasingly with modern systems and electronic technologies while maintaining a critical link to its original mandate, that is to food, agriculture, and rural communities. 1

X. Dissemination of research results

49. Do you have any suggestions on how USDA's dissemination of Federal agricultural research results can be improved?

Dissemination of research results can be more efficient and widespread through the Information

Superhighway. National leadership and expertise will be needed to ensure that results are properly interpreted and verified before being dispersed, or erroneous results could cause major disruptions if spread widely. The standards of the review system long utilized by professional scientific societies for critical review of manuscripts by editorial boards prior to acceptance for publication, must be adhered to in electronic publication as well. These societies help in the training of their members in the review process and in the dissemination of research results via various publications.

50. Who is, or will be, responsible for developing a marketing plan for agriculture and its science and education programs to the American people?

The office of the U.S. Department of Agriculture Undersecretary for REE should be charged with developing such a marketing plan, in accord with advice from a properly constituted Stakeholders Advisory Board for REE. Scientific societies and coalitions could also provide input to such a plan.

XI. Current Research Information System (CRIS)

51. ARS uses CRIS to provide information about USDA research projects. How, if at all, do you use CRIS?

Scientists may use CRIS when they are developing a new project in conducting a search to determine other projects in the same area, what approaches are being taken, and to access current literature on the subject. In theory, data from CRIS should save the scientist time and effort in avoiding duplication, making contacts, sharing ideas, materials and biological resources. In practice, scientists seldom use CRIS, and scientific societies rarely use CRIS. Our impression is that its primary use is by administrators and managers of research for accountability. A better system is needed.

52. In your opinion, is CRIS effective in helping you obtain information on Federal agricultural research projects? If not, what changes are needed to this information system that would provide quality data on Federal and State agricultural research? (please explain)

The system is only effective to scientists if they will use it, and this will occur if the information has value and is easily accessible. Recent upgrades to permit access via Internet make it quite user-friendly. Revision of the classification codes, which have traditionally been commodity-based and applied research-based, is needed to reflect the nature of the research being categorized.

53. Is there/should there be an appropriate and adequate management information system(s) in place to report and collate results from Federal investments in research, extension, and higher education sponsored by the USDA (and related research agencies?)

CRIS is used extensively as an accounting system for Federal investments, recording and making retrievable the distribution of expenditures across categories and commodities. The system is needed to respond to inquiries concerning the USDA investment, but other research agencies also use data from CRIS to prepare extensive reports. The system, however, is inadequate as an effective and timely data base of research activity and funding sources.

54. Does the CRIS system and other USDA reporting systems provide an adequate accounting of the research and extension work that is being done in America?

CRIS only records the information provided to it. There is a great deal of research currently funded by private industry and foundations, commodity groups, states, etc. that is not reported in CRIS because it is a system for Federal research funds in agriculture. The data included in the reports is limited because of space constraints on the information that scientists file with CRIS. Details have to be obtained by contacting individual scientists or their published works. While it is a relatively inefficient and ineffective means of providing accountability; it should not be abandoned, but should be improved.

XII. International Relations

55. How can the USDA be most effective in the short and long term through its support of international activities?

The USDA can be more effective by assuring the quality of the scientific research, and contributing to the development of the research infrastructure in developing nations.

56. Currently, USAID and other program extend agriculture and agricultural development beyond the nation's borders. What continued or expanded role should USDA play in international research, education, and extension?

The U.S. support for products it consumes/uses should be continued where other countries do not have resources or infrastructures to do so, especially in tropical agriculture. The U.S. needs products (eg. coffee) and germplasm (eg. wheat) from elsewhere for its citizens and industry. Continued support is essential to maintain or acquire these materials.

57. What is the role of USAID in funding agricultural research and extension? Has USAID maintained support for agriculture or has the agency moved away from agriculturally related programs? What is the role of long-term agriculture R&D in developing countries in developing new markets for U.S. products? Should USAID contract through USDA/REE for long-term agriculture R&D?

International agricultural research cannot be abandoned whether funded by USAID or other mechanisms. Long-term contracts would certainly be a possible route. It seems appropriate for USDA/REE to be involved, either totally or in a consultative fashion, so as to best integrate our science accomplishments into the needs of other countries.

THE AMERICAN PHYTOPATHOLOGICAL SOCIETY

Steven C. Nelson, Executive Vice President, 3340 Pilot Knob Road, St. Paul, Minnesota 55121-2097 U.S.A.
Telephone 612-454-7250 ■ [illegible] ■ Facsimile 612-454-0766 ■ E-Mail [illegible]

2 November 1995

The Honorable Pat Roberts
Chairman, House Agriculture Committee
c/o Dr. John Goldberg
Agriculture Staff
1336 Longworth House Office Bldg
Independence and New Jersey Aves. SE
Washington DC 20515

FAX: 202-225-5375

Dear Chairman Roberts,

This letter is a response from the American Phytopathological Society to 57 Questions posed by your committee to members of the community concerning agricultural research, education and extension. The American Phytopathological Society (APS) has more than 5000 members in universities, industry, cooperative extension, private practice and in the USDA or other governmental agencies. We are located throughout the United States. We have expertise in all aspects of plant health that deal with environmental and biotic plant pathogens. Our members in universities are heavily involved in teaching, research and extension. In addition to the practical protection of plants in agriculture and urban landscapes, we also investigate the reasons that plants are susceptible or resistant to pathogens. Thus in terms of research, our members span the range from very basic to very applied.

The APS endorses the responses to these questions submitted to you by the Coalition for Funding Agricultural Research Missions (CoFARM). We contributed in a significant way to the development of those answers. We realize that you will receive many responses from many different groups, and so we elected to join CoFARM in responding.

I realize that all of government is searching for mechanisms to reduce the budget. However, agricultural science seems an inappropriate target for large cuts. As a group, agricultural scientists in the United States have contributed to the most abundant, safe

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and cheap food supply of any nation in the world. Publicly supported (state and federal government) plant pathologists have been particularly effective at maintaining the consistent availability of this food supply. When major epidemics threaten major crops (e.g. the Southern Corn Leaf Blight epidemic in the early 1970s, and the current wheat scab and potato late blight epidemics), it is the publicly supported plant pathologists that respond most quickly to develop effective solutions.

Several questions (33-35) related to unnecessary duplication. No one wants unnecessary duplication and the encouragement of the highest quality science is the most effective way to avoid unnecessary duplication. The best scientists won't waste their time doing something that has already been done. Therefore encouragement of peer-reviewed publication is essential. Further, there is real danger in overemphasizing the avoidance of unnecessary duplication. Such emphasis encourages centralized and "top-down" science. Centralized science (i.e. that done previously in the eastern block and in China) has been terribly unsuccessful -- both because politics become influential and because administrators cannot have the insights available to persons actually doing the work. Additionally, not all duplication is unnecessary. Important findings need independent verification. I hope that you won't overemphasize attempts to prevent unnecessary duplication centrally.

Thank you very much for the opportunity to address these crucial issues.

Sincerely,

William E. Fry, President
American Phytopathological Society

Copies: APS Council, National Plant Pathology Board

Note: A paper version of the FAXed letter is also being sent.

AIBS

AMERICAN INSTITUTE OF BIOLOGICAL SCIENCES

Dr. Clifford J. Gabriel
Executive Director

November 3, 1995

The Honorable Pat Roberts
Chairman, Committee on Agriculture
1301 Longworth
Washington, DC 20515

Dear Chairman Roberts:

The American Institute of Biological Sciences (AIBS), a member-governed federation of 45 scientific societies and research laboratories over 80,000, is pleased to join as a signatory to the questionnaire submitted to the Committee from the Coalition on Funding Agricultural Research Missions (CoFARM). AIBS and the other CoFARM organizations coordinated and condensed our responses to the questionnaire reflecting a general consensus among the scientific community.

In addition, AIBS would also like to offer the following suggestions which we presented in the enclosed statement to the Senate Agriculture Committee earlier this year:

- USDA needs to continue to support a mix of research from basic to applied, especially multidisciplinary and systems level research.
- Applied research in agriculture is not "corporate welfare." The majority of federally supported applied agricultural research is targeted to the development of new knowledge that will lead to the improvement of farming practices, not toward new commercially viable products with wide profit margins.
- All research supported by USDA should be subject to rigorous, independent peer review.
- Support is critical for the only significant federal source of support for fundamental research in agriculture, the National Research Initiative Competitive Research Grants Program.
- With lowered commodity price supports, our nation's farmers will need improved technology in order to remain competitive in global markets.

I would be pleased to assist the committee with additional information on these comments.

Thanks for your consideration.

Sincerely,

Clifford J. Gabriel

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Addendum to the CoFARM Questionnaire Response

from
The American Institute of Biological Sciences

for
The House Committee on Agriculture

November 3, 1995

The American Institute of Biological Sciences (AIBS) is a member-governed federation of 45 scientific societies and research laboratories representing over 80,000 biologists in academe, industry, and government. AIBS would like to take this opportunity to add additional comments to the questionnaire results we submitted to the committee through CoFARM. Roughly one third of the biological sciences community AIBS represents is involved in improving agricultural productivity and sustainability as well as minimizing the negative impacts agricultural practices have on the environment. One of the key elements of the Institute's Strategic Plan states that AIBS will "support research, eduction, and application of new methods and technologies aimed at achieving agricultural sustainability such as the development of resource efficient crops, soil-conserving cultivation technology, biological pest control, and genetic engineering of cultivars that are productive, disease and pest resistant, and capable of producing in suboptimal environments."

AIBS recognizes the huge impact agriculture has on our nation's economy. Accounting for 14.2% of our gross domestic product and 22 million jobs, U.S. agriculture is vibrant and robust and contributing positively to our trade balance. However, this balance is precarious. As the full impact of recent trade agreements (i.e., NAFTA and GATT) are felt, U.S. farmers will need the best technology and information available to continue to be successful in international markets.

Therefore, it is crucial that the nation's agricultural research and education base be supported to foster further technological development and environmentally sound farming practices. Currently, the U.S. Department of Agriculture spends $1.16 billion in research. This investment is split between intramural (ARS, $726 million) and extramural (CSREES, $434 million excluding extension) programs. The Farm Bill must lay the blueprint for how the Department will invest limited resources to promote U.S. agriculture for the next five years.

To assist Congress in deliberations of the research provisions of the Farm Bill, AIBS offers the following guiding principles:

- **The USDA needs to support an appropriate mix of research spanning the continuum of fundamental to applied including multidisciplinary and systems level research.**

Even though the range of research activities can be described as a continuum from fundamental to applied, Congress should not assume that this continuum is linear. Technological advances in agriculture have not proceeded in a linear fashion from fundamental research to application. Rather, advances have arisen in unpredictable ways. For example, early research on the plant disease crown gall and its causal agent *Agrobacterium* has led to revolution in new cultivar development through genetic engineering. The agricultural biotechnology industry is expected to develop into a multi-billion enterprise in the near future. This was an unpredictable event that no program manager or researcher could have foreseen. Such examples argue strongly for a healthy mix of fundamental and applied research.

- **Applied research in agriculture is not "corporate welfare."**

The majority of applied agricultural research supported by the federal government is targeted to development of new knowledge that will lead to the improvement of farming practices. It is not targeted to new commercially viable products with wide profit margins. The true beneficiary of federally supported applied research is the American farmer and consumer, not big business. Congress needs to fully discern the relationships among federally supported applied research, the farmer, and agribusiness before major reductions in applied agricultural research budgets are recommended and enacted.

- **Even though a variety of funding mechanisms are needed to support agricultural research (i.e., competitive grants, formula funds, and in some instances special grants), all research supported by the USDA should be subject to rigorous, independent peer review.**

Rigorous, independent peer review is the best way to ensure the quality of science supported by the USDA. Research proposals subject to the thoughtful constructive criticism of outside experts will not only strengthen USDA's research portfolio, but will also improve accountability for how research dollars are spent.

- **The National Research Initiative Competitive Research Grants Program (NRI) is the only significant federal source of support for fundamental research in agriculture.**

Even though the NRI invests heavily in "mission linked" research (37% in 1994), this competitive grants program is the only significant source of federal funds for fundamental research in agriculture. The National Science Foundation funds research related to agriculture, but tends to discourage fundamental research with direct potential application to agriculture. AIBS strongly supports the NRI and encourages Congress to continue its support for this program. Even under the immense budgetary pressure we are currently experiencing, AIBS urges increases in this crucial program.

- **Research assessment should be left to the marketplace.**

Occasionally, there are calls to pre-screen agricultural research to determine if it fits a specific set of production goals and objectives. While the arguments can be appealing from a social engineering perspective, they should be discouraged. Any attempt to pre-judge agricultural research on anything but quality of science will set agriculture on a slippery slope to inefficiency and will stifle science. History indicates tat the assessors will more than likely be wrong or the criteria they used to judge will change with changing philosophies of agricultural production. In fact, scientists tend to self-adjust their research to reflect national needs. For example, most agricultural scientists are seriously thinking about how their work affects the environment and the long-term sustainability of agricultural production. There is no need for a group of pundits to determine if proposed research passes a litmus test on these or any other topics.

- **If commodity price supports are reduced, our nation's farmers will need improved technology to be competitive in global markets.**

Provisions reached under both GATT and NAFTA will place increasing demands on U.S. farmers to maximize efficiency if they are to compete successfully in world markets. This is especially true as commodity price supports are reduced or eliminated. Strong agricultural research programs and the application of knowledge derived from these programs is the best way to ensure continued prosperity of agriculture. AIBS recommends that if savings are realized from reductions in commodity supports, a certain percentage of these dollars should be reinvested in agricultural research. For example, if 10% of an estimated $1 billion in savings from deductions in price supports was directed to the NRI, it would double the existing NRI budget. With a documented high rate of economic return for dollars spent on agricultural research, continued growth in the NRI's budget makes sense. At full funding ($500 million), the NRI can fulfill the original mission detailed in the 1989 NRC report *Investing in Research*, which led to the creation of the NRI.

AIBS hopes you find these comments useful. Please contact Dr. Clifford Gabriel at 202-628-1500 ext 260 if you have any questions regarding this statement.

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CAST
The Science Source for Food,
Agricultural, and Environmental Issues

October 27, 1995

Dr. John Goldberg
House Agriculture Committee Staff
1301 Longworth Building
Washington, DC 20515

Dear John:

CAST was pleased to receive an invitation to respond to the July 12, 1995 request from Congressmen Roberts, Allard, de la Garza, and Johnson to questions posed for the Research Title of the 1995 Farm Bill. We applaud their solicitation of input from the scientific community on legislation that will impact the future direction of science to serve agriculture.

The strength of CAST is its demonstrated ability to utilize multidisciplinary teams of scientists to review the pertinent research findings on issues of national concern related to food, agriculture, and the environment and communicate that information to public policy decision makers and the media. The request of July 12 submitted to CAST is outside that arena, in that, the questionnaire places us in the world of opinions rather than the compilation of scientific data. Nonetheless, in an effort to be of service, CAST undertook the challenge given to it.

The CAST Board of Directors at their fall meeting, October 14, 1995 endorsed the submission of the attached responses with the following caveats:

1) the responses are best described as opinions offered by one or more board members and do not necessarily reflect the opinions of the entire board.

2) the responses attached have not been reviewed by the individual CAST member societies, thus the responses are neither endorsed nor rejected by CAST member societies.

3) the number of responses generated per question should not be construed as the importance attached to the questions, it more accurately reflects the manner in which the questions were subdivided.

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From the responses received, by different board members to the different sets of questions, we have attempted to identify both the consensus as well as the divergence of opinions to the questions where appropriate. We would emphasize that these opinions are a very limited subset of the members of CAST. However, we trust this cross section from CAST, along with the many others you are likely to receive, will be of benefit to the Congressmen and their staff as they proceed to identify the priorities that will benefit agriculture and the public.

Sincerely,

Richard E. Stuckey, Ph.D.
Executive Vice President
on behalf of the CAST Board of Directors

c: CAST Board of Directors

COUNCIL FOR AGRICULTURAL SCIENCE AND TECHNOLOGY (CAST)

Response to the House Agriculture Committee's Questionnaire

Federal Agriculture Research Goals

1. What should be the role of the Federal Government in agricultural research?

The responses to this question differed from an active to a passive role for the federal government in agricultural research. In support of an active federal role, the reasoning is that the infrastructure, the tradition, and the experience are in place and should be applied.

A. Basic research is a primary function of the federal government. Industry and state governments are not likely to fund basic research at anywhere near the level necessary to sustain a strong agriculture and food system.
B. Federal involvement also provides a coordination function, helping to avoid unnecessary duplication of efforts.
C. Much research yields benefits that accrue across state and regional boundaries. States are unlikely to fund such research at the optimum level--from a national interest perspective.
D. Certain technologies, such as integrated pest management, are unlikely to yield commercially profitable services or products. Without public funds, this research is not likely to be done.
E. The federal government shoulders some responsibility to assure an internationally competitive industry. Without sufficient research, this position will be compromised.
F. Only the federal government can deal with national problems with the admonition that,"If the federal government doesn't do it, no one else will".

From the passive viewpoint, the federal government should be a granting agency and not a direct user of funds. For this concept to work, there needs to be:

A) a national food policy developed with clearly stated objectives such as a) to maintain and enhance food availability and affordability, b) to maintain and enhance food safety, desirability, and nutritional value, and c) to minimize risk to the environment from food production, processing, and marketing;
B) the development of a workable system for assessing and prioritizing research needs for carrying out the national food policy;
C) a rational plan for phasing out federal research programs and facilities including three options: a) transfers to universities, b) continuation with funding through grants and contracts from public and private sources, or c) closure.

2. To what extent should goal setting and goals in agricultural research be cognizant of and coordinated with research activities in the rest of the Federal research sector (HHS, EPA, DOE, etc.)?

It is imperative that there be close coordination in setting goals by the various agencies that are involved with or have major impacts on agriculture; however, such coordination alone is not enough. Active cooperation is also needed in addition to more joint projects. Duplicated research efforts among agencies can no longer be afforded. USDA research should build on research in other federal agencies and USDA needs to take the lead in coordinating efforts with these agencies. Joint research projects can be encouraged by establishing a national food policy and by grant funding specifically for joint, cooperative projects.

3. **Is the process associated with the Food Animal Integrated Research for 1995 (FAIR 95) adequate for the development of Federal agriculture research goals? Are there goal identification process which might better serve to enhance Federal agricultural research other that FAIR "95"?**

   No response.

4. **If the process of FAIR "95" were to be used to adopt an agenda for Federal agricultural research, how would the goals identified in FAIR "95" and listed below, need to be modified to address the concerns of all research stakeholders?**

   1) **Enhance industry wide responsiveness to consumer and social concerns;**
   2) **Meet market demands through increased efficiency and competitiveness;**
   3) **Develop integrated food animal management systems;**
   4) **Maintain and enhance environmental quality;**
   5) **Improve food quality control in terms of safety, desirability, and nutritional compositions, and**
   6) **Enhance animal well-being throughout the life cycle of food producing animals.**

One respondent replied that these topics are too broad and general for specific comments but suggested that the priority be changed to 5), 1), 4), 2), 3), and 6).

Another respondent stated that this list is not a research agenda but rather an industry development plan.

Priority Setting

5. **Is Federally funded agricultural research focused on the issues of highest priority for producers, processors, and consumers? If not, how can the priority setting mechanism be improved to insure that these issues are addressed?**

Although attempts are made to focus resources on priority issues, vast improvements are needed. Some suggestions might be:

1) the Joint Council on Food and Agricultural Sciences is directed by Congress to set priorities for USDA research and issues a report to the Secretary of Agriculture entitled "Priorities for Research, Extension, and Higher Education". This report tends to be very general and all-encompassing. It needs to be much more focused and to identify the top priorities for USDA research.
2) USDA could adhere more closely to the advice and guidance in the Joint Council's Report. There needs to be a stronger linkage between the development and the implementation of research priorities.

3) the method of selection of the USDA-ARS National Program Staff should be re-evaluated. Senior scientists tend to be promoted to NPS. Too often these scientists have developed philosophies that are more responsive to societal perception or personal agenda than to science-based reality. An alternative selection process could enhance the administrative abilities and improve the visionary quality of the NPS.

6. Should Federally funded agricultural research address specific technological and industrial needs? If yes, does the present system fulfill this goal (If not, please describe how this can best be accomplished)?

Yes, USDA resources must be focused on specific technological and industrial needs if these resources are to be utilized effectively to advance food and agriculture technology. There must, however, be a clear definition of the role of government versus that of industry.

The present system does not fulfill this goal: 1) the linkage between setting and implementing priorities is not in place, and 2) expertise to manage USDA's research programs can be improved. The contrast between how USDA and large industrial companies manage their research is striking. A major overhaul of USDA's management system and improvement in management expertise is required to improve productivity and effectiveness of USDA research dollars.

Federally funded research should not address immediate or very short term objectives. Industry should be capable of doing this for itself except possibly for concerns that affect the whole industry across the board or where profit motives will not provide the incentives for private sector investments. Long range concerns are appropriate for federally funded research.

7. Does Federal agricultural research adequately address projects that result in quantum leaps in benefits, or does it dwell too much on incremental benefits?

There is no doubt but that improvements can be made to realize more "quantum leaps in benefits". For example, USDA needs to redefine its mission to recognize that it must apply its resources to fewer but higher priority issues. Having defined its appropriate mission and role for the next century, USDA can apply and manage its limited resources and increase the probability for "quantum leaps". ARS could also close rural labs and focus additional efforts at university campuses or other locations where intellectual and visionary intercourse are more likely to occur (compared to applied work performed at rural field stations).

While federal research should address "quantum leaps", incremental advances should not be dismissed. The greatest agricultural productivity advances have come through incremental progress. This is likely to continue. Unfortunately, quantum leaps are difficult to foresee and plan. Many of the most dramatic quantum leaps began as a research project producing incremental benefits.

8. What is the appropriate role for USDA/REE in insuring competitiveness in the face of decreases in price support programs?

This is the most critical role for USDA/REE. Growers do not fear elimination of price supports as much as they worry about how to compensate for their loss and staying competitive. The USDA's role should be to assure that the industry has the research information, through universities and ARS, to provide technological advances in agricultural production, environmentally benign practices, and generally assure the most competitive food and agriculture system in the world. Sufficient funding for efficient state extension programs should be assured while also eliminating duplicative and competitive extension programs operated by CREES and NRCS.

9. How can the appropriate Federal-State-Industry resource pools be integrated to develop high priority regional programs in research, teaching and extension?

These three groups have basically two target groups to consider - producers and consumers. By availing themselves to these groups, these agencies should be able to determine what the research needs are and set priorities for them including long range goals and delivery systems.

Long-term special projects that include closely integrated participation among agencies have been particularly efficient and productive. The STEEP (Solutions to Environment and Economic Problems) research project in the Pacific Northwest is an excellent example of a cooperative, long-term research and extension program that includes more than 100 state and federal scientists, and technical and administrative advisory groups that include scientists, growers, and agribusiness. The STEEP program has been operating for 18 years and the model for its composition and administration has been used in proposals for many similar programs domestically and internationally. Principal public agencies include land-grant universities in Idaho, Oregon, and Washington, and USDA-ARS, USDA-NRCS, and EPA. All state projects are funded through competitive grants administered by the state experiment stations. All state and federal grants are reviewed by the advisory committee. Funds for ARS projects are incorporated into base funding for the agency and are disbursed non-competitively. STEEP annual meetings often include "green" organizations but efforts to incorporate these groups into the advisory structure has not been successful. There is unique leveraging of dollars, expansion of communication, and increase in productivity and focus that occurs in well-constructed, long-term research and education programs.

There is a great amount of duplication and competitiveness in services by federal, state, and commercial institutions. The research and extension system at land-grant institutions is well proven and is being adapted worldwide, but has been eroding domestically. Proliferation of federal agencies has eroded funding for the traditional research and education system at land-grant universities. Base program funding to universities (formula funds) have decreased 20% in purchasing power in the past decade. This situation can be corrected by re-focusing the missions of federal agencies and departments.

10. How important is the Federal agricultural research role in supporting other agencies of USDA? Of other Federal agencies? Could this be done more efficiently and at a lower cost?

The agricultural research role is extremely important in supporting nearly all other agencies of USDA. This support could be done more efficiently and effectively by assigning responsibility for all in-house research to one agency i.e. ARS rather than splintering USDA research across several agencies.

Leaders of agricultural research should communicate with each other and certainly to other government agencies with related interests such as the EPA and FDA. One perception of big government is that each agency is a monolith which follows its own agenda e.g. in the area of food safety, USDA, FDA, and EPA all have different protocols. All seek to protect their turf rather than advance the status of the agriculture and food sector. Surely, there can be some harmonization.

More cooperative agreements among all federal agencies would eliminate redundancy and may realize the "quantum leap" research.

11. **USDA reorganization created the Cooperative State Research, Extension and Education Service (CSREES). In your opinion, how should this newly configured agency function to support the U.S. agricultural enterprise, 1995-2002?**

The concept of agricultural extension as a depository of current knowledge and chief conduit to farmers is outmoded. Agribusiness institutions have developed very sophisticated technology transfer concepts and are now a major conduit of information to farmers. But there is a role of extension as expediters of knowledge transfer such as short courses, symposia, etc. The land grant universities have less of a role in extension education programs directly to farmers and more of a role in sophisticated technical education to industry.

12. **What is the proper place for integrated systems programs? What role should the Extension Service (extension functions within CSREES) play in these programs.**

No response.

Advisory Boards

13. **Have USDA's research and extension advisory and coordinating boards been effective in planning and prioritizing agricultural research and extension (please explain).**

Advisory boards serve a worthwhile purpose by ensuring that input from all areas of concern is considered. They help maximize societal benefits and avoid duplication of USDA research and extension programs. In relatively young agricultural industries and emerging areas of concern related to agriculture, advisory boards are extremely important in setting directions. The well-established areas usually have both formal and informal mechanisms that have evolved which ensure that input gets to administrators and policy makers, making advisory boards less important.

Advisory boards are in an excellent position to see the application of agricultural research since they are usually composed of high proportion of users of research findings and recipients of extension efforts. Consequently, advisory boards have been instrumental in keeping "usefulness" as a high priority objective for most agricultural research.

Although advisory boards have been mostly beneficial in planning and prioritizing research and extension, the interests of individual researchers and extension specialists have a powerful influence on setting priorities, especially at the local level. This is more true in research than extension.

14. **How have research or extension priorities been changed as a result of the recommendations of advisory boards (please provide examples)? Are there presently too many advisory boards?**

Advisory boards have been responsible for increased efforts in breeding programs for disease and pest resistance, increased growth and yields, and improved quality of crops and animals, more emphasis on ornamentals and turf and other urban agricultural needs; expanded use of integrated pest management; greater concern for environmental aspects of agriculture; and development of programs in sustainable agriculture.

There may be too many advisory boards with special interests. Boards should have broad interests and be interdisciplinary in nature. The advantages of advisory boards outweigh the disadvantages, making it worth the risk of having too many.

15. **What options should Congress consider to improve USDA's process for planning and prioritizing agricultural research? (I.e. how should the research agenda be prioritized?)**

A high-level policy board from a wide array of backgrounds and with a national view is needed to develop an overall food and agriculture policy for the nation. After the policy is established, priorities should be set to meet these policies. Such national policy and priorities for agriculture would provide guidelines for advisory boards, for individual researchers and extension specialists, and for administrators in funding research and extension activities.

16. **What role should stakeholder advisory boards play in setting the agenda? What groupings should be represented on advisory boards? Can "customers" and "partners" be accommodated on one board or will it require two?**

Stakeholder advisory boards play an important role in the planning and prioritizing process by bringing problems and needs of the industry to the attention of researchers and extension specialists. This interaction helps provide focus on current industry priorities and problems, which is essential, but may result in a shortsighted perspective, because current problems tend to be viewed as the most important. Long-range and anticipated needs must be a part of the priority-setting and decision-making processes. Stakeholder boards are less likely to provide long-range views than broadly focused, interdisciplinary boards representing all segments involved, including but not limited to university scientists, extension specialists, industry personnel, producers, consumers, service agencies, regulators when applicable, and environmental groups. All of these groups must be accommodated on the same board rather than separate boards. Separate boards would fragment the efforts and result on divisive priority setting. Customers, partners, and stakeholders working together promotes understanding and results in more balanced and reasonable recommendations.

17. **Is there a special role for advisory boards to play in international agriculture beyond what has occurred in the past?**

Additional effort is needed in some areas involving international agriculture. More assurance of food quality, prevention of dissemination of pests and diseases, protection from pesticide residues, guarantee of intellectual property rights including crop varieties, and equalizing environmental regulations as needed. Generally, advisory boards may view international agriculture as competition, so policy regarding international agriculture should be made by boards with a broader view than advisory boards typically have. Nevertheless, one advisory board should serve both USDA and USAID on international agriculture. Attention should also be give to the great benefits derived when scientists, university faculty, and students work internationally, especially in a time when U.S. agriculture must compete with technologies globally.

Funding Considerations

18. What is the most appropriate mix of Federally funded basic and applied agricultural research?

This question, as would be expected, provoked a range of answers, partly depending on one's definition of basic and applied:

a) 75% basic and 25% applied with all the basic research having a definite goal for application in a reasonable time frame.

b) There should be a range of funds and, therefore, ratios of funds for basic versus applied research. There should be a base of support for basic research in the range of 30% of the available funds, and the maximum should probably not exceed 45-50%. That ratio should be assessed for each budget and changes should be deliberate and multi-year when possible. Changes should not exceed 5% + per year.

c) Research must have a foundation of basic research that should be "untouchable". Without such a premise, there can be little or no continuity in research.

d) The federal government must support both kinds of research but the mix will vary depending upon the specific science.

19. How, if at all, can the effectiveness and efficiency of agricultural research be enhanced at current funding levels? At reduced funding levels?

The effectiveness and efficiency of agricultural research can be enhanced by:

a) requiring, ex ante, some calculation of cost/benefit (accountability) for the results of the research. Recognizing it is difficult for basic research, some evaluation should still be required.

b) reduce the number of research sites. Research needs to be carried out where the expertise is available.

c) A mark of a well-run research organization is how and when to stop projects and programs. USDA research program staff should evaluate projects and/or programs annually, dropping some to generate resources for allocation to promising new areas. Additionally, each unit should have a plan and program to re-train and upgrade skills of their people. Work ethics must be uniformly high.

20. How can future funding be determined and justified so as to permit multi-year programs to be completed?

Projects should be funded as a total project with the total amount budgeted at the time of awarding the contract. Money would be released according to a predetermined schedule as each phase of the work is completed. For the first few years, therefore, less projects would be funded. This would also improve the efficiency of the overall research process as fewer proposals would be written, reviewed, and rejected. Projects could always be terminated mid-term for poor performance or low output.

Set multi-year programs at some safe level of the overall budget, for example, 60-70%. Other funding would be awarded in order of decreasing priority. USDA should continue to work with other organizations to help assure funding stability.

21. In view of the growing emphasis on greater accountability of Federal expenditures, do you have any suggestions as to how agricultural research results can be measured and their impact evaluated? Is there some standard of accountability for the efficient and effective use of Federal research funds?

Agricultural research results can be evaluated through:

a) Greater use of external advisory committees ranging from farmers and consumers to industry science managers.
b) Empowerment of an oversight committee which is reasonably independent of USDA.
c) Require a report on results of all federally funded projects. Each project proposal should include a projection of the economic impact. Upon completion, the impact assessment should be revised to reflect the success of the project.
d) Inclusion of agricultural economists in research planning.

22. What is the proper balance between in-house, formula funds,competitive grants, and special grants?

Most responses indicated that competitive grants provide the best use of research dollars and the most probable in returning good results and, therefore, should be of highest priority. Special grants, especially for facilities, are probably, on the average, the poorest use of federal research funds. Formula funds provide an important base of support to research and extension which, if eliminated, would result in significant reduction of research and extension capacity, especially in smaller states.

One respondent suggested a range for each type with a "floor" for each that is fixed for a multi-year period (3-5 years).

23. What guidelines should be used in determining appropriations for "specified programs" in research education, and extension?

The current guidelines used by USDA appear to be satisfactory. A review of the procedures is in order by a "blue ribbon panel".

At the national level, each commodity group should set priorities; these priorities then become the focus of research, extension, and teaching grants.

Funding of specified programs in research, education, and extension should be based on perceived need and the most cost effective way to acquire the information to service those needs. Funding will change as needs change.

24. Should Federal funds be used for programs only, or for facilities as well? If for facilities, how should they be allotted - competitive proposals or other? Is there a place for regionalizing research, increasing competitive grants, etc.?

Most respondents felt that facilities should be funded on a competitive basis. One reply stated that federal funds should be for programs only; buildings should be the responsibility of the state in which they are built.

There is a significant need for major scientific equipment grants. Federal funds for such a program would do much more to enhance quality of research than grants for buildings.

There is not only a place for regional research but all federal programs should be directed toward encouraging and/or mandating regional efforts.

25. Is there a place for partnerships not only with state and local public sector organizations and industry; but also with private foundations?

Yes, the partnership concept must be expanded and made more sophisticated. There is substantial opportunity for more effective use of resources using this approach.

26. To what extent do self-assessed "check-off" fees on commodities provide resources for research and education? Do these/should these programs support long-term research, as opposed to short-term product development and promotion research?

A recent report issued by the GAO (GAO/RCED-94-63) indicates that, on average, 14% of the funds received by commodity research and promotion boards on the national level is used for research. [This percentage did not consider allocations by state and regional programs and it appears that at least twice as many dollars by percentage are allocated for research by these programs (approximately 30%).] Research activities include product development, nutrition research and marketing research. So that, if national checkoff boards receive $250 million in assessments, approximately $35 million is being spent on research. It is difficult to assess the level of funds going into educational expenditures due to the variety of classifications of activities; however, consumer information programs at the national level account for 6% or $15 million.

Most respondents believed that the tendency would be to fund short term and applied projects rather than long term basic research projects. One respondent notes, however, that several industries have utilized "research center" concepts in which both private industry and the commodity boards fund basic research to the benefit of the industry. Due to the lack of profit motive for individual participants, much of this basic research is left to be funded by the commodity boards.

Delivering agricultural research

27. In order of priority, what would be the most significant actions USDA could take to improve it's management and/or delivery of agricultural research?

USDA is perceived to be too big and too inefficient. An external review of USDA by a reputable management consultant firm regarding its organization, structure, role, and definition of its priority initiatives might be useful.

28. What options should Congress consider to improve the delivery, results and benefits of Federally funded agricultural research?

Competitive grants should be enhanced.

29. What should be the Federal role in insuring training of future work forces for the food and fiber needs as well as the natural resource concerns of the public?

A highly coordinated recruitment program needs to be initiated. Information concerning professional opportunities and jobs should be circulated to all agriculture colleges.

Land Grant Universities

30. What is the continuing role of Land Grant Universities? 1890's Colleges? 1994 Colleges?

Land grant universities form the backbone of the nation's agricultural research system and are the primary developers of human resources for the entire food and agriculture system. Federal funds have helped nurture this system to the point where many of its institutions are world renown. This system is emulated by many nations of the world. These universities will and should continue to play the dominate role in agricultural research, education, and technology development. Stable federal support will help assure the strength of the system and help direct research efforts on national priorities.

Collaboration among the land grant universities and the 1890's colleges should be encouraged.

31. Is the current formula used for allocating Federal funds to land grant universities fair, reasonable, and does it address changing conditions? If not, how could it be improved?

No response.

32. The land grant universities have a system of agricultural experiment stations in each state. In today's environment of federal and State fiscal constraints, is an extensive system of research stations still warranted (please explain)? Could certain functions be merged with other USDA agencies, other Federal agencies, etc.?

Consolidation has occurred in many states. Each state needs enough field stations to assure that research, especially crops research, is appropriately tailored to local environmental and edaphic conditions.

33. How can agriculture research be best coordinated among Federal, State and private institutions?

No response.

34. What models currently exist, and are in use to provide regional cooperation in research and extension?

Several states cooperate on teaching programs, extension education, and research. In some of these cases, funds are actually transferred across institutions to fund joint activities. CSREES could facilitate more of this cooperation by providing some of its grant funds solely for multi-institutional projects.

35. In the current era of constrained resources, is it appropriate to use Federal funds to promote cooperative regional research to reduce unnecessary duplication; and to what extent is it appropriate to use Federal funds to encourage consortia of states to establish individual centers of excellence to address common problems?

This is highly appropriate. It is the very sort of role the federal government should play. States, in some cases, may not be able to effectively eliminate unneeded duplication due to local political pressures. Federal funding could help achieve effective multi-state efforts.

36. As societal concerns about natural resource use, rural development, animal well being, etc. are integrated into the USDA agenda, is there a role for "new" partnerships with the Federal sector?

No response.

37. Other parts of the Federal Government sponsor research directly applicable to the food and agriculture system. The National Science and Technology Council is intended to address the coordination of related activities across agencies. How is this intended to work in the case of research and extension of food and agriculture? How well is it actually working? Are methods needed?

No response.

38. Congress authorized the National Research Initiative (NRI) Competitive Grants Program at $500 million per year. If the NRI is to be fully funded, where in the USDA research budget could money be transferred from?

The USDA could fund the NRI through efficiency savings in their research budget. Some efficiency savings include:

a) reduced duplication of research effort across services within USDA.
b) restructuring of ARS to focus entirely on "quantum progress" objectives. Technology transfer could be facilitated by state university research and extension.
c) additional closures of labs that are marginally or ill- equipped to meet the goals of the new mission.
d) removing non- productive or marginally productive scientists within the USDA-ARS. A perception exists that international exposure is a prerequisite for promotion, resulting in an abundance of overseas travel just prior to promotional efforts.
e) directed and mandatory transfer of scientist's work location to establish more efficient teams to work on current and evolving goals. This concept is used more actively by industry and the military.
f) leaner operations and construction budgets.
g) eliminate special grants and use the funds in NRI.

39. What other options for funding the NRI should Congress consider?

The options that Congress could consider for funding the NRI include:

a) Establish a credible argument that agricultural productivity Is paramount to national security, that increasing production efficiency is critically dependent upon technological advances, and that every individual American should support this national interest by contributing one additional dollar to a dedicated fund coordinated by the ITS, thus bringing in up to half the money required for the NRI.
b) Cutting and/or reducing subsidies on commodities, rural electrification, and a number of other programs and diverting part of the funds to research.
c) The ultimate beneficiaries of food and agriculture research are consumers, especially the lowest income. In the current Congress there is clearly a disposition toward reducing food assistance programs. Some of these savings might appropriately be directed to agriculture and food research so as to ultimately keep food costs to the low income sector of society as low as possible.

40. Have NRI appropriations been used to expand agricultural research or have they been used to continue existing programs?

One respondent replies that the NRI grants have been used to broaden the research applicable to and not merely to further existing programs. Another respondent stated that NRI funds are used for their intended purpose - to expand agricultural research. Funds are used mostly for fundamental research. The most successful labs are those with existing track records in areas related to current NRI funding objectives. Allocations to those labs can be interpreted as either bolstering existing programs or creating additional opportunities for expanding agricultural research - the difference is not clearly defined.

Agricultural Research Service (ARS) Laboratories

41. Should the USDA have research laboratories or should it provide competitive funding to existing entities such as universities?

Competitive is preferred.

42. Should more ARS laboratories be co-located at land grant universities? What should be the relationship between ARS and land grant university scientists? Between ARS research coordination? How can ARS laboratory functions be more effectively linked to State Agricultural Experiment Stations?

ARS labs should be located at land grant universities and much more collaboration should be expected.

ARS scientists should be encouraged to engage in graduate student training where facilities are located on campuses.

ARS is quite possessive about identity and turf protection. Full partnerships with universities is compromised by this management strategy. More effective public relations could be achieved if ARS and universities approached the public as a single entity.

43. Are ARS laboratory facilities effectively used in performing needed research? If not, please explain and offer suggestions for better use?

Two questions need to be asked much more often: Are we doing the right research? Does it make a difference?

Extension Service (Extension function within CSREES)

44. The USDA Extension Service's (ES) mission is , among other things, to disseminate research results to farmers and other customers. In your opinion, is the ES effective in carrying out this mission? (Please explain).

Yes, the Extension Service is effective but it could be more so if:
a) they had access to modern communication technology.
b) if the agents could concentrate on their jobs. Many ES personnel have wide breadth of knowledge but not much depth. They are required to have knowledge of engineering, plant pathology, yard care, animal diseases, etc. Yet numerous offices are without a fax machine or a computer on-line network. Delivery of research and education to farmers is still the primary focus for most ES personnel but their handicaps are great.

45. Should the ES be involved in addressing the problems and challenges confronting urban populations?

Respondents differed significantly in replying to this question. Some respondents expressed that ES should be involved with urban problems such as youth development, urban development, human development, conservation and environmental issues. Another respondent stated that the

ES delivery of education to farmers would be enhanced if urban problems were discouraged; there are many distractions for ES personnel that reduce agricultural education.

46. What, if any, role should ES play in dealing with the social issues facing farmers and rural communities?

Respondents differed significantly in replying to this question. One replied with a simple "none". Another respondent thinks that these issues which have a big impact on the farmer's health and productivity should be a part of ES activities but only to the extent of identifying such problems; other agencies can resolve these issues better and frees the local ES agents to concentrate on their jobs. While another replied that ES has a critical role in economic development, resource management, youth and leadership development.

47. Should the ES's mission statement be changed to focus activities on production agriculture?

Respondents differed significantly in replying to this question. Two-thirds replied in the negative with one going so far as to say that if production agriculture is their only focus that it is dead and probably not needed. On the other side, to be an efficient partner, the ES should confine its activities to production agriculture.

48. What should ES not be involved in?

See Questions 45, 46, and 47. Also, ES should not be involved in welfare and social programs.

49. Do you have any suggestions on how USDA's dissemination of Federal agricultural research results can be improved?

USDA's dissemination of federal agricultural research results may be improved by:

a) enhancing Extension's delivery system
b) the use of contemporary, pertinent, and consumer-friendly publications such as FDA-Consumer.
c) forming more education and training partnerships with the private sector.

50. Who is, or will be, responsible for developing a marketing plan for agriculture and its science and education programs to the American people?

This area has been a major disaster. There has not been a comprehensive plan and it needs to be a major priority. Land grant colleges, agriculture and education departments, extension, as well as agriculture teachers could be helpful in designing such a plan.

Current Research Information System (CRIS)

BEST COPY AVAILABLE

51. ARS uses CRIS to provide information about USDA research projects. How, if at all, do you use CRIS?

CRIS is used in research projects. It would be helpful if more agricultural education department projects were a part of this system.

CRIS needs a major overhaul and modernization. Conceptually it is excellent but additional research categories are needed. Extension education projects should also be added to CRIS as they often contain research components and CRIS data on extension programs would provide highly useful accountability information.

52. In you opinion, is CRIS effective in helping you obtain information on Federal agricultural research projects? If not, what changes are needed to this information system that would provide quality data on Federal and State agricultural research? (please explain)

Yes, CRIS is helpful in obtaining information on federal agricultural research projects.

53. Is there/should there be an appropriate and adequate management information system (s) in place to report and collate results from Federal investments in research, extension, and higher education sponsored by the USDA (and related research agencies)?

Yes.

54. Does the CRIS system and other USDA reporting systems provide and adequate accounting of the research and extension work that is being done in America?

Yes.

International Relations

55. How can the USDA be most effective in the short and long term through its support of international activities?

In the short term, USDA can be more effective by directing extension resources to assist agribusiness, farm organizations, and producers in international marketing of agricultural products and providing training in international consumer preferences, food safety and quality standards, and processing and packaging requirements.

In the long term, USDA can probably be most effective through significant support of international collaborative research. This research should "start where people are" and develop from that point. US approaches to problems should not be imposed; more "needs" assessments should be implemented. This support should include graduate student as well as scientist exchanges.

56. Currently, USAID and other programs extend agriculture and agricultural development beyond the nation's borders. What continued or expanded role should USDA play in international research, education, and extension?

USAID should fund research that can have a significant impact while also utilizing indigenous knowledge systems. USAID often takes a short range approach to economic development through agricultural programs, and in many cases, the motivation is political. The USDA and the land-grant universities have the expertise to greatly enhance USAID's effectiveness in international agriculture, and USDA should be a full partner with USAID on all matters relating to agriculture. This would ensure better coordination across agencies and better use of the resources of the USDA, land-grant universities, and USAID in longer range international projects that can help developing nations feed their people and stimulate economic growth. USAID and USDA should encourage and fund student and faculty exchanges.

57. What is the role of USAID in funding agricultural research and extension? Has USAID maintained support for agriculture or has the agency moved away form agriculturally related programs? What is the role of long-term agriculture R&D in developing countries in developing new markets for U.S. products? Should USAID contract through USDA/REE for long-term agriculture R&D?

USAID clearly has a responsibility in funding agricultural research and extension because of its stake in agricultural development. As has been proven repeatedly, a country cannot progress in other areas until its agriculture is productive. Therefore, it cannot free up labor to work in other enterprises and thus will not have resources to be a major purchaser of US agricultural products. USAID has undoubtedly moved away from agriculture in developing countries with its emphasis on democratization, population control, and child survival. These are certainly noble causes, but long term agricultural R&D is crucial.

Several countries serve as examples of the beneficial effects of long term agricultural R&D on new markets for US products. Among them are Korea, Thailand, Indonesia, Brazil, Mexico, and other Latin American countries. Agricultural R&D has not only contributed substantially to economic development in those and other developing countries but have contributed substantially to the US economy by making them large importers of US products.

Because of the declining emphasis on agriculture in the USAID, the agency has lost much of its agricultural expertise. As a result, it is important that USAID contract with USDA and land-grant universities for both long- and short-term agricultural research and extension programs. Such programs could have tremendous positive impact on agricultural R&D in many parts of the world but the approach to such projects should be reviewed; the outmoded and linear approaches used over the last 25-30 years are largely ineffective, inefficient, and not sustainable.

NASULGC National Association of State Universities and Land-Grant Colleges

November 2, 1995

The Honorable Pat Roberts, Chairman
The Honorable E "Kika" de la Garza, Ranking Member
The Honorable Wayne Allard, Subcommittee Chairman
The Honorable Tim Johnson, Subcommittee Ranking Member
House of Representatives
Committee on Agriculture
Room 1301, Longworth Office Building
Washington, DC 20515

Dear Sirs:

Thank you for the opportunity to respond to the agricultural research, education and extension questions posed by the House of Representatives Agriculture Committee. Careful consideration has been given to each of your questions knowing these are issues Congress must address during this time of declining resources.

To answer these questions, the Extension Committee on Organization and Policy (ECOP) solicited responses from the five Extension regions of the United States. These responses were combined into the attached single document. Questions were answered from the framework of the Smith Lever Act of 1914, our enabling legislation. In some instances, a historical perspective or other pertinent information was added to assist you in your decision making process.

Again, thank you for this opportunity. The ECOP looks forward to working with you as this process continues.

Sincerely,

Gail L. Imig

Gail L. Imig,
ECOP Chair and Director
Michigan State University
Cooperative Extension Service

Enclosure

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Response to the U.S. House of Representatives Committee on Agriculture

November 3, 1995

Gail L. Imig, Chair
Extension Committee on Organization and Policy

National Association of State Universities and Land-Grant Colleges

THE COOPERATIVE EXTENSION SYSTEM

The Extension Committee on Organization and Policy answers these questions from the framework of the Smith-Lever Act, our enabling legislation, and with background information from over eighty years of helping people and communities solve their problems. In 1914, Congress passed the Smith-Lever Act which provided for the purpose as stated in Section 1: "to aid in diffusing among the people of the United States useful and practical information on subjects relating to agriculture and home economics, and to encourage the application of same."

Extension proudly claims many contributions to the development of the nation and its people. Among these are:

- supporting phenomenal growth in productivity and labor efficiency in agriculture,
- developing human resources, particularly youth, agricultural and community leaders,
- making the educational opportunities of the land-grant university meaningful and of value to all people,
- developing a lifelong educational system that has been replicated worldwide,
- building partnerships around complex and critical issues in rural and metropolitan communities,
- being a model program and funding partnership among federal, state, and local governments, and
- involving volunteers in program development, delivery, and organizational leadership.

The Cooperative Extension System is a publicly funded, lifelong educational system that links the education and research resources and activities of 74 land-grant institutions, 3,150 counties, and the United States Department of Agriculture (USDA). Extension includes 32,000 employees and 2.8 million volunteers. The state institutions are the land-grant universities established by the Morrill Acts of 1862 and 1890, institutions of the U.S. territories, Tuskegee University, and the University of the District of Columbia. This complex system is authorized by the Smith-Lever Act of 1914 and companion legislation in each state and territory.

The Cooperative Extension System maintains a unique funding partnership -- a combination of federal, state and county government funds. As a result, these entities continually shape and reshape the focus in order to meet critical issues of the times. The federal government's investment leverages four to five state, local and private dollars. The measured annual rate of return on that overall investment is between 30 and 50 percent. Federal administrative costs are less than 4 percent of federal appropriated funds.

Citizens help set the Extension agenda through local advisory committees to identify local issues within the context of state and national priorities. The focus on local needs programming leads to a high level of customer satisfaction and accountability.

In the last twenty years, shifts within the program areas were rather significant as new issues emerged and more educational and advisory services became available from the private sector. The proportion of the total program devoted to agriculture and natural resources climbed from 37 percent in 1974 to 48 percent in 1994. The proportion for 4-H, youth, and leadership development declined from 33 to 24 percent in the same period. The Home Economics and community resource development program changes were very modest during this time period.

Significant shifts also occurred within the agricultural and natural resources program with more emphasis going to environmental issues, management, and public issues such as the rural-urban interface. For example, water quality programming more than tripled during the same period and Integrated Pest Management (IPM) grew from a concept to a significant program. These shifts have been possible by fewer resources being devoted to traditional production issues where the private sector is providing more information and assistance. Extension is also devoting more attention to food safety and quality issues, nutrition, and children, youth and families at risk.

Extension programs have also expanded in the large urban counties where 63 percent of the American people now reside in 315, or ten percent, of all counties. This expansion has been possible largely through additional resources being allocated by local units of government and by partnering with other local agencies. Nationally, 40 percent of the cost of operating county Extension offices is provided from local governments. In the urban areas, this percentage tends to run even higher.

The ultimate beneficiaries of the Cooperative Extension programs are the 260 million people who consume a safe abundant, affordable food supply. Over 5.6 million young Americans participate in Cooperative Extension, 4-H, and other youth development programs which help to prepare the next generation workforce and help prevent dysfunctional youth behavior such as teen pregnancy, substance abuse, and violent behavior.

The complexity of contemporary issues requires the development of multiple partnerships, including those between federal agencies, in which the special niche of each contributes to the solution. This means that funds may be transferred among agencies so that funds are effectively and efficiently used to address the need.

In a recent national study, when asked whether more, the same, or less tax dollars should be spent on various Cooperative Extension System programs, just over 50 percent of the respondents said more funds should go to natural resources and the environment, 4-H and youth development, and family development and management. In the same study, about 40 percent think that nutrition, diet and health, and community economic development should get more money, and about 33 percent think more should be spent on agricultural production and marketing.

As Extension looks towards the 21st Century, the System has identified the following key issues in a document entitled "Framing the Future: Strategic Framework for a System of Partnerships."

- Extension must encompass both education and information giving as it establishes learning partnerships.
- Extension must serve the needs of production agriculture as well as the critical issues of people and communities.
- Extension must find ways to emphasize rural-metropolitan interdependence and serve audiences in both settings.
- Extension must honor its federal, university, and community basis and embrace each.
- Extension must continue its USDA partnerships and expand program and funding partnerships with other federal agencies.
- Regardless of its organizational structure, Extension must serve its unique function with the colleges of agriculture and extend the broader knowledge of the land-grant university as well.

Federal Agricultural Research Goals

1 What should be the role of the Federal Government in agricultural research?

To enhance a safe, healthy, stable, sustainable and affordable food supply

2 To what extent should goal setting and goals in agricultural research be cognizant of and coordinated with research activities in the rest of the federal research sector (HHS, EPA, DOE, etc.)?

Coordination and oversight should exist at the general level, but not be controlled at a central point. Sensitivity to local conditions, ingenuity, and creativity of researchers needs to be nurtured to stimulate technological innovation.

It would be desirable for Federal agencies to coordinate programs that relate to the missions of more than one agency. The appropriate level within USDA for coordination should be vested with the Under Secretary for Research, Education and Economics.

3 Is the process associated with the Food Animal Integrated Research for 1995 (FAIR '95) adequate for the development of Federal agriculture research goals? Are there goal identification processes which might better serve to enhance Federal agricultural research other than FAIR '95?

The process used for FAIR '95 resulted in the identification of appropriate goals for food animal agricultural research. A strength of the process was the extensive involvement of the animal production and processing industry.

The input process used for developing the 1994 Experiment Station Committee on Organization and Policy/Cooperative State Research Service Strategic Plan also embraced a very broad range of stakeholders. Certainly the system used to develop agricultural research goals must encompass a broad definition of agriculture and this includes representatives from producer, processor and consumer groups.

4 If the process of FAIR '95 were used to adopt an agenda for Federal agricultural research, how would the goals identified in FAIR '95 and listed below need to be modified to address the concerns of all research stakeholders?

1) enhance industry-wide responsiveness to consumer and societal concerns, 2) meet market demands through increased efficiency and competitiveness, 3) develop integrated food animal management systems, 4) maintain and enhance environmental quality, 5) improve food quality control in terms of safety, desirability, and nutritional composition, and 6) enhance animal well-being throughout the life cycle of food-producing animals.

Three of the six goals identified by FAIR '95 are specific for animal agriculture These goals should be broadened to include other production systems Additional goals should be added that relate to improved management of natural resources, rural community development, development of new uses for agricultural commodities, improved human nutrition, sustainable production systems, and provide incentives for the development of multi-state centers of excellence

Priority Setting

5 Is federally funded agricultural research focused on the issues of highest priority for producers, processors, and consumers? If not, how can the priority setting mechanism be improved to insure that these issues are addressed?

High priority issues are being addressed A balance is needed that will focus on critical issues but with flexibility to address evolving needs Research must focus on both fundamental investigations and those which solve practical problems Extension is the research link to people and should provide feedback to the research component on research needs to be addressed

6 Should federally funded agricultural research address specific technological and industrial needs? If yes, does the present system fulfill this goal (if not, please describe how this can best be accomplished)?

Yes, research should focus on needs There should be an expressed purpose to benefit the greater good/society, and current efforts generally fall into that realm Despite the success of American agriculture over the last century, there is unprecedented need for new knowledge and technology today We must ensure that the food and agriculture system is increasingly competitive in the international marketplace while maintaining an appropriate interface between production, environmental, and community concerns Additionally, there is a critical need for science-based improvements in human nutrition, food safety, family living, and rural community development

7 Does federal agricultural research adequately address projects that result in quantum leaps in benefits, or does it dwell too much on incremental benefits?

Quantum leaps come slowly, but research offering potential for such must continue since the payoff can be great At the same time, research and education must be incremental because most progress in incremental, not one giant leap

8 What is the appropriate role for USDA/REE in insuring competitiveness in the face of decreases in price support programs?

USDA/REE should take the lead to insure the security of our national food system through providing technology and education to enable the agricultural industry to be profitable, competitive, and environmentally safe

USDA/REE should concentrate on three key areas 1) basic and applied research, and Extension education to ensure an adequate scientific and technological base, 2) provision of common goods such as market information, statistical reports and computer software, and 3) serve as a lead agency and consortium builder in systems development efforts that involve USDA, agricultural colleges and universities, and the private sector

9 How can the appropriate federal-state-industry resource pools be integrated to develop high priority regional programs in research, teaching, and extension?

The existing partnership between USDA and the land-grant universities provides a good basis from which to develop high priority regional or multi-state programs A greater integration with private industry should be accommodated A process of state, regional and national needs assessment should be conducted every three to five years involving all levels of input from producers to consumers, both public and private The federal government could facilitate such a process but should not dictate the process

There are agricultural production regions that are not geographic regions For instance, the citrus research region should be California, Arizona, Texas, Florida, and Puerto Rico, which is not a traditional geographic region Perhaps regional programs could be better referred to as multi-state for funding and planning purposes

The Agricultural Research Service (ARS) should be more closely aligned with this priority program development system

10 How important is the Federal agricultural research role in supporting other agencies of USDA? Of other Federal agencies? Could this be done more efficiently and at lower cost?

The use of federal agricultural research funding to support other federal agencies, including USDA, is very important Agencies, such as the Environmental Protection Agency (EPA), the Food Safety Inspection Service (FSIS), etc are dependent on sound unbiased information in making determinations about needed regulatory practices, technical assistance, and other matters

11 USDA reorganization created the Cooperative State Research, Extension, and Education Service (CSREES) In your opinion, how should this newly configured agency function to support the U S agricultural enterprise, 1995-2002?

CSREES should focus efforts on 1) joint visioning and strategic planning with all USDA units to identify and prioritize issues, 2) liaison with other federal agencies to plan and create jointly funded research, extension, and education programs on high-priority issues, 3) national coordination of high-priority research, extension, and education programs including joint efforts with ARS and other agencies inside and outside USDA, 4) fostering development of linkages and partnerships between the State Land-Grant partners and private industry, and 5) providing the interface between the State Land-Grant partners and Congress, Executive Branch agencies, and other national decision makers

12 What is the proper place for integrated systems programs? What role should the Extension Service (extension functions within CSREES) play in these programs?

During the next decade much of the applied and adaptive agricultural research and cooperative extension programs must focus on integrated systems. Cooperative Extension does and should play a key role in demonstrating how integrated systems are established and managed, and in educating producers about the dynamics of integrated systems. Cooperative Extension specialists will need to be more highly involved in the planning and conducting of integrated systems research and related Extension programs. Local Extension educators will be essential to help producers and consumers understand and apply these complex systems. There is a need for considerably more integrated systems research.

Advisory Boards

13 Have USDA's research and extension advisory and coordinating boards been effective in planning and prioritizing agricultural research and extension? (Please explain)

Some advisory committees tried to focus on real issues that deal with improving the quality of life and economic well-being of agricultural producers as well as Americans in general. They have served as a consolidated voice for teaching, research and extension, provided valuable dialogue with the private section, and offered diverse opinions. However, political appointees often express their specific interests rather than the broader needs of the public. The current advisory and coordinating boards need a thorough review.

14 How have research or Extension priorities been changed as a result of the recommendations of advisory boards? (Please provide examples) Are there presently too many advisory boards?

The major change in recent years, encouraged by advisory boards, is away from single commodity production and processing focus to an integrated issue approach. This integrates the implications of agricultural research with environmental issues, consumer needs, and international marketplace. Research and Extension are now addressing major issues and emerging needs affecting people. Some examples are health, youth issues, public land use, water quality, and natural resource issues. Advisory boards have contributed significantly to this change. The committee base should be broadened to include non-traditional users. This would strengthen the system. Yes, there are too many advisory boards.

15 What options should Congress consider to improve USDA's process for planning and prioritizing agricultural research (i.e., how should the research agenda be prioritized)?

Any USDA process should include balanced input from professionals in research and extension and end users. Most importantly, the ARS must become a full partner in this process.

Congress should not allow federal agencies to duplicate research and action agencies should not be involved in research. Congress should assign responsibilities between federal and state research partners. A process of updating state, regional and national research needs should take place every three to five years.

16. What role should stakeholder advisory boards play in setting the agenda? What grouping should be represented on advisory boards? Can "customers" and "partners" be accommodated on one board, or will it require two?

Stakeholders and related federal agencies should both be part of the process–as should other federal agencies. Two boards could be counterproductive because they could create widely diverse agendas. On the other hand, expecting too much from one board is impractical. If more than one board exists, input, deliberations and recommendations must be coordinated.

The role of advisory boards is "advisory" only; they cannot set policy–this is the responsibility of the various directors and heads of the different agencies. Stakeholders and advisory boards should have a collective or shared role in setting research and extension agendas. Boards should be interdisciplinary, representative, and inclusive of all interests; shared leadership is the key.

17. Is there a special role for advisory boards to play in international agriculture beyond what has occurred in the past?

In this global society, the international aspects of agriculture should not be treated separately. It should be integrated into holistic research, extension and education programs.

Funding Considerations

18. What is the most appropriate mix of federally funded basic and applied agricultural research?

Research is an evolutionary process. What is basic research today may be applied research tomorrow. Therefore, a formula for the mix of applied and basic research is difficult and is extremely dependent on the knowledge base of a given discipline or possible solutions to specific problems. In some cases, this ratio could be 90 percent basic and 10 percent applied when the knowledge base is extremely low. In other cases where the knowledge base is fairly well known, the ratio could be 10 percent basic and 90 percent applied.

19. How, if at all, can the effectiveness and efficiency of agricultural research be enhanced at current funding levels? At reduced funding levels?

History and the past progress made by agricultural research systems bears out that these systems have been both effective and efficient. A means to enhance the effectiveness is to develop more team-oriented research doing systems analysis. Reduced funding will increase the competition among individual investigators, therefore reducing the progress toward developing research teams. It is critical that funds be targeted towards system analysis research, thereby overcoming the competition between individual investigators.

The use of state, regional, and local committees should be increased to set priorities for research needs. Greater lead time should be allocated in some competitive funding requests. The key, if we are to push the horizons of new knowledge, is to be close to our customers and their needs in order to assure an accurate prioritization process.

20. How can future funding be determined and justified so as to permit multi-year programs to be completed?

Formula funded research projects are typically set up for three to five years as a means to ensure multi-year research efforts. Budget cuts in base funds often reduce the operational budgets to the individual projects or reduce the number of projects funded. Short-term funded grants are not conducive for the development of multi-year projects.

21. In view of the growing emphasis on greater accountability of federal expenditures, do you have any suggestions as to how agricultural research results can be measured and their impact evaluated? Is there some standard of accountability for the efficient and effective use of federal research funds?

The Government Performance Results Act (GPRA) should be the vehicle to develop an assessment of the impact of major research and extension programs. This could be done by developing a system to determine the progress towards completion of the objectives and then determining the outcomes of these objectives. However, it should be recognized that some publicly funded research will not produce measurable returns on the investment for years, if ever. Publicly funded research must encompass some high-risk studies.

22. What is the proper balance between in-house, formula funds, competitive grants, and special grants?

Formula funds assure continuity and a base for addressing critical needs as these emerge. Formula funds are essential to maintain this scientific infrastructure. Special or targeted funds leverage formula funds to increase efficiency and effectiveness to address priority issues. Competitive grants provide flexibility to meet emerging critical needs and opportunities.

23. What guidelines should be used in determining appropriations for "specified programs" in research, education, and extension?

Specified programs in research, education, and extension should be targeted towards high-priority issues at the regional and national levels. Targeting the specific programs as high-priority areas will ensure the development of the knowledge base for critical issues and ultimately transfer the information through extension and the private sector. This approach would develop the knowledge base to address specific problems. However, impact must also be applicable at regional and national levels, the degree of specificity cannot be so great that the knowledge is not transferable geographically.

24. Should federal funds be used for programs only, or for facilities as well? If for facilities, how should they be allotted -- competitive proposals or other? Is there a place for regionalizing research, increasing competitive grants, etc.?

Funds should be used for both programs and facilities. Greater attention, however, must be placed on "true" needs for facilities and "best" location. Funds used for facilities should be accompanied by careful oversight, and could be nurtured by providing incentives for contiguous state land-grant universities to submit joint facility proposals based upon effective use and sharing of resources. This nurtures a regional perspective. Competitive proposals are appropriate if the criteria do not preclude state-initiated ideas.

25. Is there a place for partnerships not only with state and local public sector organizations and industry, but also with private foundations?

Yes, and continued emphasis on forming partnerships is essential. Many private foundations are already providing grants to help address local problems. Partnerships also exist with numerous federal, state, and local agencies of government. Private industries and commodity groups are also strong partners in research, extension, and education. Partnership activities must continue.

26. To what extent do self-assessed "check-off" fees on commodities provide resources for research and education? Do these/should these programs support long-term research, as opposed to short-term product development and promotion research?

Check-off funds are important resources which complement state and federal appropriations, generally for commodity and site-specific issues for both research and extension. The norm is for short-term programs with lesser emphasis on basic, long-term research. Check-off funds, combined with public resources, represent a healthy approach to problem solving.

Delivering Agricultural Research

27. In order of priority, what would be the most significant actions USDA could take to improve its management and/or delivery of agricultural research?

a) embrace the federal-state partnership: federal-state partnerships are formal rather than a top-down approach. Avoid micro-management of these partnership efforts. Listen to the partners in the land-grant system and leverage this major human resource capacity in meeting the needs of society. Invest more in new communications technology for immediate delivery of scientific information to large, targeted audiences.

b) impact analysis: by re-engineering the national reporting systems for agricultural research and extension into a system that would provide impacts for research and extension outcomes, the USDA could significantly improve its management and/or delivery of agricultural research knowledge, and

c) coordination provide a system for coordination of national needs for agricultural research investigations, possibly through the Under Secretary for REE

28 What options should Congress consider to improve the delivery, results, and benefits of Federally funding agricultural research?

Congress can encourage coordination and collaboration among all agencies Congress could legislate a linkage for ARS and CSREES research partners However, Congress must also recognize the need for local interpretation of research information–one of the roles of Extension educators–if the information is to be properly used and have an impact

29 What should be the federal role in insuring training of future work forces for the food and fiber needs as well as the natural concerns of the public?

The federal role in ensuring training of future work forces should be through the federal-state partnership at land-grant universities, at both the undergraduate and the graduate levels The federal-state partnership presently provides, through research grants, support for graduate education in the agricultural sciences and related fields The government should project work force trends and share this information with universities

USDA's higher education program should continue to support the federal-state partnership in agriculture A thorough evaluation of the federal role in agricultural education within the partnership is needed The federal government should provide resources for resident as well as non-resident instruction of the future work force through both formula and competitive funding

Land-Grant Universities

30 What is the continuing role of Land-Grant Universities? 1890s Colleges? 1994 Colleges?

The continuing role of 1862 land-grant universities, 1890 and 1994 institutions is to provide research, education and outreach to the citizenry Although there are many institutions of higher learning, only the land-grants integrate public service to such a high level of significance

Inherent to these university systems are the agricultural, environmental, food and life sciences, which should be a continuing role

Land-grant universities will have a more important role in the future because technology and information are increasing so rapidly Their roles in developing a skilled work force and knowledgeable citizenry will be more important than ever before These universities and their respective extension components are also committed to the concept of lifelong learning The unique role of land-grant institutions in outreach education is to make the university resource base available to its people. In the years ahead, that role will continue to be more important in addressing local issues. The results of research, extension, and education affect the well-being and quality of life of every person in this country.

Since reconstruction, the 1890 institutions have fostered the American concept of universal education dedicated to ensuring academic freedom, social equality, and the assurance of a decent future for African Americans and other economically and socially challenged ethnic groups. It should not be overlooked that 1890 institutions tend to be concentrated in states with marginal public school systems and some of the lower per capita incomes in the nation. While a national consensus is emerging pertinent to altering economic trends, the involvement of 1890s as full partners in the economic renewal of the nation remains unresolved.

In spite of political and fiscal barriers, the 1890s are intensifying their educational outreach efforts toward improving the quality of life for small farmers, low income and undeserved community residents, families and youth. The 1890s recognized that the ultimate success of this nation depends in part on the full participation by all citizens (youth, adults, poor, rich, etc.) in its social and economic activities. Therefore, 1890s extension outreach programs bring to bear the resources of the system to improve communities' ability to participate and compete in a global market economy.

To fully achieve the primary purpose of the land-grant mission, the nation must be prepared to invest in the full development of 1890 institutions. The strengths of the nation's agriculture enterprise coupled with the capacity of the 1890s are essential elements in maintaining preeminence in world markets.

The 1994 institutions are just beginning to serve a similar role as 1890 colleges, for the Native American citizenry. It is important that all efforts from the various land-grants within a state be coordinated and mutually supportive. The federal government has a responsibility to demand this coordination as funds are expanded and programs are planned and conducted.

31. Is the current formula used for allocating federal funds to land-grant universities fair, reasonable, and does it address changing conditions? If not, how could it be improved?

Yes, it generally is fair and equitable for programs serving rural America. It does not reflect the urbanization of our society. Also, the current formula should include the significance of problems faced by states. It is much more reliable than primarily depending on regional or competitive distribution of funds.

Formula funding is essential to the future of the federal/state partnership and should be continued. The current formula should continue as a baseline for funding. However, any future changes in the formula should take into account shifting demographics of the urban and rural components. Formula funds truly enable states to adjust to changes in state and local needs.

32 The land-grant universities have a system of agricultural experiment stations in each state In today's environment of federal and state fiscal constraints, is such an extensive system of research stations still warranted? (Please explain.) Could certain functions be merged with other USDA agencies, other federal agencies, etc.?

A fundamental concept of the federal/state partnership in agricultural research is the utility in having a state agricultural experiment station within each state to provide responsiveness to local, regional and national differences and needs Some research may be done at one location and extended to many others, but agricultural research quite often confronts problems that need solutions adapted to individual production areas The formation over 100 years ago of the state agricultural experiment station system addressed this need and is still relevant today This is an important structure of the federal/state partnership that should be preserved

Given the constraints to the system, individual state and agricultural experiment stations are partnering with other stations to gain greater efficiency and to have a greater impact through shared responsibilities, resources, and information Regional research is becoming ever more important for getting the job done, and institutions are jointly planning research programs, sharing results, and distributing credit for the successes they are having through new strategic partnerships

The benefits of mergers with some ARS or other federal research efforts in specific instances may be worth exploring on a site-specific basis

33 How can agriculture research be best coordinated among federal, state, and private institutions?

There is presently extensive coordination among federal, state, and private institutions for agricultural research The federal/state partnership in agricultural research has, for the past ten years, jointly planned an agricultural research agenda This has been coordinated with advisory committees to the Department of Agriculture, and this has set the framework for regional and institutional planning nationwide Involvement of private institutions, the private sector, commodity groups, and special interest groups takes place through the planning mechanisms that have become an integral part of the federal/state planning process

Within the regions, a process is being designed to facilitate inter-institutional collaboration in teaching, research, and extension We believe that this is indicative of the evolutionary process that is being experienced to provide enhanced coordination among all players and interest groups This should become the norm in the teaching, research and extension interface

34 What models currently exist and are in use to provide regional cooperation in research and extension?

Both research and extension have regional coordinating groups that meet regularly Most extension regions also have regional program leadership committees to encourage programming across disciplines and state lines. A number of states are actively engaged in additional joint programming efforts. Regional research projects have been funded for many years.

There are models in several states where land-grant research and extension personnel are assigned to ARS stations and ARS researchers are working on university research and extension centers or on campuses. ARS and CSREES cooperation and coordination should be enhanced.

The Pacific Northwest states of Idaho, Oregon, and Washington have several joint programs, i.e., STEEP. Minnesota and North Dakota share sugarbeet and potato extension faculty. The Southern Region shares an aquaculture research/extension program. Already, the Northeast Region has identified their cross-functional common values as they step towards inventing new processes and strategies for improved inter-institutional collaboration.

35. In the current era of constrained resources, is it appropriate to use federal funds to promote cooperative regional research to reduce unnecessary duplication; and to what extent is it appropriate to use federal funds to encourage consortia of states to establish individual centers of excellence to address common problems?

It is entirely appropriate to use federal funds to promote cooperative regional research. Regional research coordination reduces unnecessary duplication, and encourages states to pool resources to build programs of excellence in agricultural research. In some instances, it makes sense to create consortia, and many successful examples could be cited. There are, however, careful considerations that must be evaluated to avoid unintended consequences of using consortia instead of state partnerships. Regional centers and consortia should be constructed only of paper and not bricks and mortar. Also, all centers should have a "sunset" review after three to five years. Regional efforts have to be built on strong state members, supported in a way to provide a base upon which to allow flexible and quality regional research.

36. As societal concerns about natural resource use, rural development, animal well-being, etc., are integrated into the USDA agenda, is there a role for "new" partnerships with the federal sector?

Yes. CSREES has a major responsibility for facilitating new partnerships in the federal sector. The proposed USDA research and education coordinating council is needed. A similar government wide group should also be considered.

Coordinated resource management teams are one example of partnership efforts between a number of federal, state, and private organizations, agencies, and individuals designed to solve problems of agricultural producers and to coordinate multiple use of resources. Again, in the west, a consortium for removing mineral salts from brackish agricultural drainage water involves another set of partners from the federal, state, university, and the private sector. Cooperation is excellent.

37 Other parts of the federal government sponsor research directly applicable to the food and agriculture system The National Science and Technology Council is intended to address the coordination of related activities across agencies How is this intended to work in the case of research and extension on food and agriculture? How well is it actually working? Are alternative methods needed?

The Department of Agriculture is a major player in the National Science and Technology Council's process for coordinating activities As the representative for the federal/state partnership, the USDA helps plan strategies for participation in research directly applicable to the food and agriculture system Examples of research coordination include joint planning with the U S Environmental Protection Agency, IPM research, joint planning of fundamental science with the National Science Foundation, coordination with the Department of Energy in plant science research, and many other projects

Changes have been recent; therefore, full impact is yet to be fully realized Direct participation by the state partnership should certainly help plan and coordinate activities across agencies with a common interest to the agricultural research agenda, at present, this is forbidden by the Federal Advisory Committee Act

National Research Initiative

38 Congress authorized the National Research Initiative (NRI) Competitive Grants program at $500 million per year If the NRI is fully funded, where in the USDA research budget could money be transferred from?

Sufficient USDA research funds are not transferable Redirecting the money from other research would severely cripple the entire agricultural research enterprise

39 What other options for funding the NRI should Congress consider?

a) a trust fund could be established and tax-deductible agribusiness contributions could be used to build up the corpus; and

b) if commodity programs are scaled back, there should be increased investments in agricultural research to insure the continued competitiveness of American agriculture

40 Have NRI appropriations been used to expand agricultural research or have they been used to continue existing programs?

The NRI has definitely expanded research in emerging technologies (e g biotechnology) to allow research otherwise not possible

41 Should the USDA have research laboratories or should it provide competitive funding to existing entities such as universities?

ARS has provided valuable agricultural research knowledge for the nation The ARS has been responsive to executing agency needs and the quality of science performed by ARS is broadly appreciated

42 Should more ARS laboratories be co-located at land-grant universities? What should be the relationship between ARS and land-grant university scientists? Between ARS research coordination? How can ARS laboratory functions be more effectively linked to State Agricultural Experiment Stations?

The land-grant university system has been openly receptive to partnerships with ARS scientists at virtually all locations Co-location exists in numerous areas, some on campuses and others at Experiment Station sites away from campus Where appropriate, ARS and university scientists should work cooperatively on teams to solve real problems The university system of Cooperative Extension could be a source of input for ARS research priorities, identified at the grass roots

Opportunities exist for joint appointments for ARS scientists to participate in teaching and extension and to have more budget flexibility for collaborative programs By streamlining the USDA's cooperative agreements, land-grant institutions would be more willing to work with ARS in joint activities

43 Are ARS laboratory facilities effectively used in performing needed research? If not, please explain and offer suggestions for better use

For the most part, ARS laboratories are viewed positively for their performance of research, and their responsiveness to Agency objectives

44 The USDA Extension Service's (ES) mission is, among other things, to disseminate research results to farmers and other customers In your opinion, is the ES effective in carrying out this mission?

The USDA-ES does not disseminate research results, this is done through the Cooperative Extension System of state partners This System has been and is very effective in gaining adoption of practices by farmers; agribusiness, and farm-related organizations and agencies An examination of the changes in farming practices over the past several decades substantiates the integral role that Extension educational programming has played in increasing productivity, adoption of appropriate technology, and greater attention to conserving and enhancing the natural resource base associated with agriculture The mission of Extension as defined with in USDA is significantly narrower than the mission of the majority of State Extension Services, which are responding to state and local demands reflecting the breadth of the Land-Grant Universities

Extension has been very effective in carrying out its educational mission to help people build their capacity to make sound decisions and achieve their goals Extension has also contributed significantly to "disseminating research results" or "technology transfer." However, technology transfer is far too narrow a concept. Most technologies are transferred through the marketplace. Extension's role has more to do with "adapting" these technologies to local conditions, "synthesizing" or modifying and building them into production systems, and "assessing" their effectiveness.

Increasingly, the private sector consultants and firms will provide commercial agriculture more production and marketing assistance. Extension's role is shifting to deal more with the "public good" and with education for the private sector consultants. They are becoming a primary customer of Extension because they do not have convenient or direct access through any other one channel to the research base. Extension must also devote more attention to issues affecting the agricultural firm's ability to continue to co-exist with the rest of society and deal with environmental and rural-urban interface issues.

45. Should the ES be involved in addressing the problems and challenges confronting urban populations?

Absolutely. Extension should focus on the interdependence of rural and urban issues and not separate the two. The educational process must span the continuum from production to consumption. Agriculture does not stop at the farm gate, nor should extension, education, or research. Issues of water quality, pesticide use and safety, nutrition, leadership, and youth development are among the issues that transcend the rural and urban interface. The mission of the land-grant university is to serve the needs of the people of that state regardless of where they reside.

USDA, the federal partner, provides just under 30 percent of the total budget of the Extension System. The remaining 70 percent is provided by 50 state legislatures and 3,150 units of county government. Each partner brings its own set of interests and priorities to the partnership of Extension's educational programs. Legislators and other community leaders have recognized Extension's success in rural America and are now insisting that Extension's expertise and methods also focus on critical issues in urban districts. The viability of the partnership requires that Extension find ways to emphasize rural-urban interdependence while continuing to serve its important educational role in the agricultural industry and rural America.

46. What, if any, role should ES play in dealing with the social issues facing farmers and rural communities?

Extension must deal with societal issues facing farmers and rural residents. The dysfunctional family is not apt to continue to have a profitable competitive farm, nor is youth with low self-esteem apt to be the successful farmer of tomorrow. The rural community, without adequate support services, is not apt to support a viable agriculture in the long run, and a community without a strong infrastructure with good non-farm job opportunities is not apt to provide for a viable agriculture system. Hence, societal issues must be addressed if we are to achieve our production and agribusiness outcomes in the longer run.

The societal issues facing rural agriculture can only be met by the total land-grant university system's research capacity The Economic Research Service and the Agricultural Research Service are not now positioned to meet this need for new knowledge This is another benefit of the federal-state partnership providing a comprehensive source of research results to help solve very complex issues

47 Should the Extension mission statement be changed to focus activities on production agriculture?

The mission of Extension should not be changed Currently about 48 percent of the resources are directed to agriculture and natural resources Agriculture should remain a major thrust with the focus on profitability and sustainability, not just production If the Extension programs are to be based on local needs, the current mission statement is appropriate Related issues of environmental concerns, economic development, families, and youth continue to be relevant areas of Extension educational programming, particularly since the state extension services are integral parts of the land-grant university

48 What should Extension not be involved in?

Extension should not be involved in 1) distribution of funds, 2) provision of services that do not involve learning, 3) activities that do for people that which they can do for themselves, 4) case work, except as a learning exercise to improve the efficiency and effectiveness of Extension's education programs, 5) activities that compete with private sector entities, 6) activities that compete with other public sector entities (all Extension activities should be collaborative), and 7) regulation (Extension is the educational alternative to command and control regulation)

Dissemination of Research Results

49 Do you have any suggestions on how USDA's dissemination of federal agricultural research results can be improved?

The current system or process to disseminate federal research, especially ARS, operates with varying degrees of effectiveness with the educational programs and activities of the Extension specialist and the county educator There currently is no official mechanism to disseminate ARS research directly, except on an established cooperative basis More effort should be centered on using electronic technology Modern media technology, such as World Wide Web, would be an excellent means of getting research disseminated, however, a large number of agricultural producers are not equipped to access that method All extension faculty do have access and must assist those producers to learn about these research results There are several operational and quite successful models between ARS and Extension for effective dissemination of research results (See question 15 for a response to how the planning process will assist the dissemination process)

50 Who is, or will be, responsible for developing a marketing plan for agriculture and its science and education programs to the American people?

This responsibility should be a collaborative effort of the USDA and land-grant universities USDA could establish a marketing unit, separate from the information unit, to assist in coordination and generation of marketing programs This should be linked to the Extension System through the ECOP The private sector should be included to add reality to the exercise and to be a player in the marketing process Adult and youth audiences should be represented in the planning and marketing process A wide and diverse group should be involved in developing a marketing plan for agriculture and its science and education programs to the American people

Current Research Information Systems (CRIS)

51 ARS uses CRIS to provide information about USDA research projects How, if at all, do you use CRIS?

Extension faculty and staff make very little use of CRIS Extension specialists commonly use journal articles, experiment station and USDA technical publications, papers presented at professional societies, interactions among research and extension faculty in universities, exchanges among peers in other states and interactions with industry researchers as their sources of information Generally, CRIS reports are written in technical terms for internal research management and accountability rather than as a source of results information for dissemination

52 In your opinion, is CRIS effective in helping you obtain information on Federal agricultural research topics? If not, what changes are needed to this information system that would provide quality date on Federal and State Agricultural research? (Please explain)

CRIS wasn't designed for Extension use in research results retrieval However, CRIS provides a potentially important information resource to the federal-state partnership The CRIS staff provide excellent services that are responsive and rapid to the partnership's need The system is considered to be the best set of descriptive data available on U S agricultural research, and the information is considered essential for research management

The present criticism of CRIS is that the information provided is not current and that the data and results are not accomplishment (outcome) based The federal-state partnership needs a truly current information system, operating in real time, that is principle investigator searchable (who is doing what), and to identify the accomplishments of research investments in terms of impact and consequences All of this is "doable," but not currently available through the CRIS system

53 Is there/should there be an appropriate and adequate management information system(s) in place to report and collate results from Federal investments in research, extension, and higher education sponsored by the USDA and related research agencies?

Yes, there should be management information systems in place. These systems should be designed for differing audiences and purposes. Potential audiences include internal administration, peer researchers, extension specialists and educators, private sector users, legislators, and the public. Purposes include accountability for use of resources, reporting of significant outcomes, encouragement of the application of results, and public relations. Obviously, the design of the system for each audience and purpose would differ greatly. The system should make use of state-of-the-art communications systems and not become overly cumbersome or so demanding of staff time that it becomes dysfunctional.

54. Do the CRIS system and other USDA reporting systems provide an adequate accounting of the research and extension work that is being done in America?

Current reporting systems do not provide an adequate accounting of research and extension work. Appropriate development and use of GPRA should enhance the accountability process. Extreme care should be exercised in establishing GPRA procedures to allow flexibility for local and state program uniqueness and accountability.

International Relationships

55. How can the USDA be most effective in the short and long term through its support of international activities?

USDA should concentrate on a two-way benefit. The paradigm needs to change from viewing international work as being the United States helping the poor, underdeveloped countries to one of acknowledging that the United States benefits both in terms of research as well as building a global economy from the participation. We have much to learn from countries, and if we approach international work from a symbiotic relationship, much can and will be accomplished.

56. Currently, USAID and other programs extend agriculture and agricultural development beyond the nation's borders. What continued or expanded role should USDA play in international research, education, and extension?

USDA should assume a critical clearinghouse function and should maintain an active file of interest in such projects by the states and communicate opportunities to state research, education and extension leaders. Delivery of agricultural research to aid development of other countries should, in the long run, make them better customers for agricultural products.

57. What is the role of USAID in funding agricultural research and extension? Has USAID maintained support for agriculture or has the agency moved away from agricultural related programs. What is the role of long-term agriculture R&D in developing countries in developing new markets for U.S. products? Should USAID contract through USDA/REE for long term agriculture R&D?

USAID has provided important funding for the network of international agricultural research centers, and to the land-grant universities as bilateral programs through specific funding mechanisms. In-country programs have also supported land-grant university activities in agricultural research and development.

Given the end of the Cold War, this is perhaps the best time to revise the U.S. international agricultural research and development strategy in ways that better take advantage of strengths of the federal-state partnership, with an international perspective. There appears to be a diminished interest in technical assistance programs, and a greater interest in fostering collaboration in agricultural research and education (both as teaching and extension).

EXPERIMENT STATION COMMITTEE ON ORGANIZATION AND POLICY
Experiment Station Section
The Division of Agriculture
National Association of State Universities and Land-Grant Colleges

October 26, 1995

The Honorable Pat Roberts
The Honorable Wayne Allard
The Honorable E (Kika) de la Garza
The Honorable Tim Johnson
United State House of Representatives
Committee on Agriculture
Room 1301, Longworth House Office Building
Washington, DC 20515-6001

Gentlemen:

I am responding to your letter of July 12, 1995 which invites responses to your list of questions on the Agricultural Research, Education, and Extension System. On behalf of the Experiment Station Committee on Organization and Policy (ESCOP), we greatly appreciate the opportunity to provide this input to the decision-making processes influencing the future of agricultural research in this country.

The State Experiment Station System has intentionally provided the Committee with four regional reports, rather than a single integrated response. We believe the regional perspectives will be useful to the Committee in its deliberations. While there is substantial complementarity in these responses, the differences are, in our view, also important. Indeed, these differences, implicit in the founding principles for the State Agricultural Experiment Station System, continue to bring the necessary diversity and richness to the System. You will receive these reports separately from the four regional associations.

While we have discussed the responses with our Extension colleagues, we have not attempted to create totally interlocking responses. In reviewing the Extension response, we find that there is a substantial amount of commonality between it and the regional responses of the Experiment stations. But, we also see the fundamental differences in focus and insights that should, again, be useful to the Committee.

The attached brief paper outlines a few of the most important points in our regional responses to your questions which might serve to summarize the position of the State Agricultural Experiment Stations in the aggregate.

Please feel free to call on any of us if we can be of further assistance. We thank you for your interest and strong support of the agricultural research enterprise and look forward to working with you in the deliberations on Title XVI of the Farm Bill in the days ahead.

Sincerely,

CJ Scifres

Charles J. Scifres
Chair, ESCOP

xc: N. P. Clarke
David MacKenzie
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Summary of Responses

Agricultural Research, Education & Extension Questions

The Experiment Station Committee on

Organization and Policy

October 13, 1995

The leadership of the U.S. House of Representatives Committee on Agriculture and the Subcommittee on Resource Conservation, Research, and Forestry asked for responses to a list of "open-ended discussion questions" as a prelude to the examination of the Research Title of the Farm Bill.

In the case of the State Agricultural Experiment Stations (SAESs), the four regional associations of Experiment Station Directors were asked to address the questions. The Experiment Station Committee on Organization and Policy (ESCOP) believes that separate responses of the four regional associations provides very useful complementarity but distinct perspectives in the answers to the questions posed by the Committee. A founding principle of the SAES system was recognition of distinct and unique needs of agriculture as influenced by variations in environment, geography and culture. This rich diversity still exists today so the differences among regions are as important as the commonalities. Therefore, while ESCOP represents the SAESs at the national level, it has chosen not to make a separate response to the questions. Instead this brief summation is intended to high-light a few of the most important over-arching principles which are illustrated by, and drawn from, the more detailed regional responses.

Federal Agricultural Research Goals

The role of the federal government in agricultural research continues to be pivotal in providing the knowledge and technology that keeps U.S. agriculture competitive in the international marketplace. With less funding for various farm support programs, there is even greater need for a balanced and well directed portfolio of research to reduce environmental and economic risk in producing food and fiber, enhance food safety and quality, and make prudent use of natural resources in an environmentally sound manner. There is growing need and opportunity to link with other parts of the federal science establishment to contribute to the ability to meet these challenging goals.

Priority Setting

While there is an ongoing and relatively effective mechanism in place for setting priorities, there is both need and opportunity to improve this process in the face of the present budget constraints. While maintaining a broad portfolio, more focus can be brought to the most important priority areas. The role of the federal government in tackling the tougher, pervasive problems requiring longer term and higher risk research is one which should be maintained. Site-specific research should be left to state and local government and industry.

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Advisory Boards

There is strong consensus among all concerned that the advisory functions (a) are very important and will become ever more important as the dynamics of agriculture change in response to changes in farm support programs, and (b) can be done more efficiently and effectively. The state members of the state-federal partnership in Research, Education, and Extension should be provided better opportunity to work more closely with USDA in agenda and priority setting in the partnership mode. In turn, there is need to develop better communication between the performing partners and the various customers they jointly serve. The report language accompanying the bill that established the Cooperative State Research, Education, and Extension Service describes joint policy making functions at the level of the Undersecretary. Exemption from the limitations of the Federal Advisory Committee Act (FACA) would greatly facilitate the partnership communication.

Funding Considerations

The research capacity of the State Agricultural Experiment Stations has been seriously eroded over the last five years -- by as much as 20%, perhaps even more. While the Congress has been generous in protecting most of the current funding for agricultural research, relative to other reductions, the ability to respond to increasing needs for new knowledge and technology--much less to continue to meet current demands--does not exist. The Agricultural Competitiveness Initiative has been proposed as a mechanism for providing mandatory funding for research, education, and extension. The continuing high rate of return on investment in agricultural research is well established. The new agenda emphasizes reducing economic and environmental risk related to production, international competitiveness, enhanced quality and safety of food, and sound environmental and natural resource stewardship.

Delivering Agricultural Research

New approaches for establishing and prioritizing the major elements of the research agenda are proposed in the recommendations from each region. A modern management information system that provides the timely and precise information needed to meet needs of customers and to provide a measured accountability for use of public funds is badly needed.

Land Grant Universities

The contribution of Land Grant Universities to the development of U.S. agriculture is unquestioned. However, as agriculture itself changes, so must the research base which supports it. Land Grant Universities are in the midst of unprecedented self examination and resulting change, often precipitated by gut wrenching reductions in state and other funding. Both internal and external environments are producing change. These changes affect our people, both those who conduct and those who use the science, drastically on the short term. Perhaps more important are the impacts on the direction of science and technology on the long term. The close interrelationships of research and teaching at our land grand universities also means that the changes influence the ability to create human capital. However, there are a number of exciting new paradigms of cooperation that have emerged at state, regional, and national levels. Change at the federal level is being influenced by the President's Science and Technology Council. The state partners need a more definitive involvement in the planning of the science agenda through this mechanism. It is very timely and propitious for the Committee to consider the results of ongoing studies and to draw conclusions about the most appropriate way for the to consider the results of ongoing studies and to draw conclusions about the most appropriate way for the federal government to participate in the creation and execution of change.

The National Research Initiative

While it is a relatively new program of research with longer term pay-offs, the NRI is demonstrating a sound contribution to problem solving for the food, agriculture and natural resource system of the U.S. Along with formula funding, the National Research Initiative remains at the top of the list of priorities among Directors of State Agricultural Experiment Stations. While the NRI has fallen short of its goal of $500 million per year in new funding, the Agricultural Competitiveness Initiative (ACI) calls for a broader support for research, education, and extension. These funding sources, formula, NRI, and ACI, in the aggregate and fully funded, would provide a sound foundation for the future of the SAES system.

Dissemination of Research Results

With modern electronic and communications capabilities, the opportunities to improve technology transfer have never been greater. These new capabilities, coupled with the institutional linkages between research and extension in land grant universities, offers the best of both worlds to address the increasing needs of a more complex system of producing food and fiber and for effectively competing in the international marketplace. Modernization of the CRIS to more effectively communicate results of research, coupled with a new management information system that provides for accountability and cost effective implementation of the Government Performance and Results Act can enhance the total communication process and better serve the multiple constituencies that count on agricultural research results.

International Relationships

There is increasing understanding of the importance of recognizing that U.S. agriculture must find its long-term competitive positions in the global village. From creation of the human capitol for the future, to research and extension activities serving those who operate in the broader environment, there is a profound need to expand visions and to deal with the new paradigm for U.S. Agriculture. There is need to better understand the needs and demands of international customers, and to produce and develop the products that will meet these requirements at competitive prices. Contributing to the knowledge and technology necessary to reduce poverty and provide food for an expanding population in developing countries should be part of the broader strategy. The Land Grant University System is in position to make a continuing contribution towards achieving all these goals. The new Research Title should provide the pathway toward a more effective involvement in the international agenda as it pertains to U.S. agriculture.

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**WESTERN ASSOCIATION OF
AGRICULTURAL EXPERIMENT STATION DIRECTORS**

OFFICE OF THE EXECUTIVE DIRECTOR

October 25, 1995

Dr. John Goldberg
U.S. House of Representatives
Committee on Agriculture
Room 1301 Longworth House Office Building
Washington, D.C. 20515-6001

Dear Dr. Goldberg:

Per the request of July 12, 1995 from Representatives Pat Roberts, Wayne Allard, E. (Kika) de la Garza, and Tim Johnson, enclosed please find responses to the questions posed in their letter regarding agricultural research, education and extension.

We appreciate being given the opportunity for input and further appreciate the effort being made by the committee for addressing important programs.

The responses represent the collective input from the member Directors of the Western Association of Agricultural Experiment Station Directors. We have attempted to be as brief as possible, yet cover what we believe are the salient points.

Again, thank you for providing this opportunity. If I can be of further assistance, please contact me.

Sincerely,

Robert Heil
Executive Director

Enclosure

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Agricultural Research, Education and Extension Questions for Discussion

October 25, 1995

Federal Agriculture Research Goals

1. What should be the role of the Federal Government in agricultural research?

> To provide adequate R&D to ensure that there is an abundant, safe, nutritious, and diversified food supply for the people of this country. It is clear that the private sector will do a great deal of research, but there will be many areas where the public sector will have to continue in order to move the food and fibre production forward to keep pace with the demands of the consuming public. The federal and state governments should partner to make sure that the environmental issues that impact all of us should be appropriately identified and dealt with. These are not issues which the private sector will address.
>
> Federal and state partnerships through "Formula Funds" should be looked at seriously as the mechanism for the future in solving the problems of state, regional and national problems. Problems of states and region, if left unresolved, may become federal problems. National and regional issues cannot be addressed by individual states. These issues can best be addressed by multi-state corroborative efforts supported by the federal government.

2. To what extent should goal setting and goals in agricultural research be cognizant of and coordinated with research activities in the rest of the Federal research sector (HHS, EPA, DOE, etc.)?

> To the extent that common interests and objectives exist relative to the development, protection and conservation of resources, it would be desirable to develop a mechanism to provide for greater coordination and perhaps joint planning. They should be coordinated but certainly not controlled centrally. Coordination can be at the Washington, D.C. level on a somewhat limited basis. Maximizing coordination can be done by facilitating communication among the Research Directors within and among agencies to identify opportunities for research collaboration.

3. Is the process associated with the Food Animal Integrated Research for 1995 (FAIR '95) adequate for the development of Federal agriculture research goals. Are there goal identification processes which might better serve to enhance Federal agricultural research other than FAIR '95?

> FAIR '95 was designed for a specific commodity. It worked well for its intended use. It would not necessarily be wise to try to apply this model to all of agricultural research. The basic components of FAIR '95 are worth preserving. Planning efforts of Fair '95 have been incorporated into the USDA-Joint Council Research, Extension and Education priority setting process. Focusing on only one process or entity will not provide for addressing the broad research and education needs.

4. If the process of FAIR '95 were to be used to adopt an agenda for Federal agricultural research, how would the goals identified in FAIR '95 and listed below, need to be modified to address the concerns of all research stakeholders?

- Enhance industry wide responsiveness to consumer and social concerns;
- Meet market demands through increased efficiency and competitiveness;
- Develop integrated food animal management systems;
- Maintain and enhance environmental quality;
- Improve food quality control in terms of safety, desirability, and nutritional composition; and
- Enhance animal well-being throughout the life cycle of food-producing animals.

> It is doubtful that too much would need to be changed except to add a component that deals with long-term basic research that will be needed for the development of new technology. Again, the Fair '95 priorities can easily be incorporated into a process such as that which has been utilized by the Joint Council.

Priority Setting

5. Is Federally funded agricultural research focused on the issues of highest priority for producers, processors, and consumers? If not, how can the priority setting mechanism be improved to ensure that these issues are addressed?

> In general, yes. Current procedures in setting priorities and research evaluation direct research to high priority areas. So-called high priority items, whether it be for producers, processors or consumers, tend to reflect immediate and short term needs as they should. It is, however, unwise to direct all resources to so-called high priority items at the expense of long-term basic research which is critical to the development of new technology, or long-term applied research, both of which require 5 to 10 years or more to lead toward implementation of a new technology. As the GPRA comes about, a strong effort to coordinate strategic plans should be made. Currently, research and extension are involving customers in their planning and this should continue.

6. Should Federally funded agricultural research address specific technological and industrial needs? If yes, does the present system fulfill this goal (if not, please describe how this can best be accomplished)?

> YES. The present system is certainly working in this area. Is it enough? Probably not but with present resources the effort does not seem out of line. Perhaps the greatest weakness is in technology transfer. Greater emphasis on private-public partnership might help.

7. Does Federal agricultural research adequately address projects that result in quantum leap in benefits, or does it dwell too much on incremental benefits?

> This is not an "either/or" situation. Science is built on incremental progress as well as major breakthroughs. All "quantum leaps" have roots in incremental research. Maintaining an appropriate balance of basic, applied and developmental research is the key issue.

8. What is the appropriate role for USDA/REE in ensuring competitiveness in the face of decreases in price support programs?

> We can remain competitive and maintain a safe, secure, nutritious and affordable food supply only through the development and implementation of new technology. REE must be a strong advocate for this position. At this point in time there is no clear understanding of what an appropriate level of investment in agricultural R & D should be. This could be a role for the REE.

9. How can the appropriate Federal-State-Industry resource pools be integrated to develop high priority regional programs in research, teaching, and extension?

> There are many examples where this is occurring at the moment. Do we really need some perceived new system? Build on the strengths of current regional research efforts such as Hatch Regional, IPM, SARE, and collaborative efforts which exist between SAES's and ARS.

10. How important is the Federal agricultural research role in supporting other agencies of USDA? Of other Federal agencies? Could this be done more efficiently and at lower cost?

> Obviously agencies such as NRCS, FSIS, APHIS, etc., rely on USDA-ARS and the land-grant system for new technology and general research support. This seems more efficient than having each of these agencies trying to do their own research. There are always some efficiencies to be gained, but the need for some new system is not evident. There are numerous examples of SAES's receiving contracts and grants from other agencies. These efforts are mutually beneficial and should continue.

11. USDA reorganization created the Cooperative State Research, Extension, and Education Service (CSREES). In your opinion, how should this newly configured agency function to support the U.S. agricultural enterprise, 1995-2002?

> CSREES should be the hub around which the multifaceted partnership revolves. This new agency cannot meet its obligation without research, extension and education. The agencies' research capabilities and capacities to extend information to the customers and educational programs rest within the universities. CSREES should openly invite partner and customer representation in developing its strategic plans, budgets and program implementation and evaluation.

12. What is the proper place for integrated systems programs? What role should the Extension Service (extension functions within CSREES) play in these programs?

> Integrated systems should be developed in almost all aspects of our business. Extension is critical to the success of any integrated system. Many joint AES-Extension efforts such as IPM, Water Quality, Sustainable Agriculture, Integrated Resource Management, etc., are all examples of where integrated systems are becoming a key part of the activity. Systems Science is important to the long term well-being of Agriculture. Systems are diverse, complex and hard to define. It will require all the skills we have in CSREES, REE and the partners to have an impact.

Advisory Boards

13. Have USDA's research and extension advisory and coordinating boards been effective in planning and prioritizing agricultural research and extension? (Please explain)

> It has been difficult for these boards to function at a level that allows prioritization beyond very broad concepts. It is much easier for that to be accomplished at the regional and state level. We do have a number of what appear to be overlapping groups. The current process does involve the appropriate actors but could utilize streamlining and more coordination among groups.

14. How have research or extension priorities been changed as a result of the recommendation of advisory boards (please provide examples)? Are there presently too many advisory boards?

> Priorities have changed tremendously in the past 5-10 years. Priorities continue to focus on production, marketing or processing related problems. However, the priorities have been expanded to include social issues (largely environment, safety, etc.) and with emphasis on competitiveness. Many of these changes have been the result of input from advisory boards at the local, state, regional and national level. We could do without the ASTRB but, otherwise, the number seems about right. The complexity of agriculture makes it difficult for one board to address all the issues and needs.

15. What options should Congress consider to improve USDA's process for planning and prioritizing agricultural research? (i.e., how should the research agenda be prioritized?)

> The FAIR 95 process, while expensive and time consuming, does provide one model that allows for input from both stakeholders and customers which seems to be the accepted model. Grass-roots input is crucial. Strengthening and streamlining the current Joint Council process is perhaps the best thing to do. the entire agriculture research community needs to work together to this end.

16. What role should stakeholder advisory boards play in setting the agenda? What grouping should be represented on advisory boards? Can "customers" and "partners" be accommodated on one board or will it require two?

> As stated above, a single board simply cannot assimilate all of the necessary information. We are dealing with volunteers and they do not have time to be effective, in spite of the fact that it sounds simple and appropriate to appoint one joint board. A planning structure that integrates customer input beginning at the grass roots level would be ideal. All customers and partners need to be involved.

17. Is there a special role for advisory boards to play in international agriculture beyond what has occurred in the past?

> The international arena is probably the least understood and one that requires the greatest effort. The short answer is, yes. There is a generally held perception that for anyone in U.S. agriculture to assist a foreign country is somehow to give away our technology and therefore

our competitive edge. Yet, if we are to market our products internationally, many of the developing countries who are potential customers need to develop foreign exchange, and for many that can only be through increased agricultural production which generates wealth to buy our products.

Funding Considerations

18. What is the most appropriate mix of Federally-funded basic and applied agricultural research?

There is no obvious or agreed upon answer to this question. Both basic and applied efforts need to be funded. The key factor is there needs to be flexibility in order to shift emphasis when needs or opportunities arise.

19. How, if at all, can the effectiveness and efficiency of agricultural research be enhanced at current funding levels? At reduced funding levels?

Actual cuts plus inflation took most of the slack out of the system a long time ago. Some efficiencies can be gained in research as in food production by implementing new technologies. Unfortunately, new technologies will be developed only if the research effort is sufficiently supported. Effectiveness — several studies have indicated that annual return on investment in agricultural research is in the 30-50 percent category. The system IS effective. If research budgets are to be reduced further, then Congress and the public must expect food and fiber to cost more, to be less safe, and have less diversity.

20. How can future funding be determined and justified so as to permit multi-year programs to be completed?

The long standing formula funding is yet to be matched or exceeded in its ability to permit completion of multi-year programs. Several studies document this to be true. These funds provide the base for implementing and completing those research needs identified as being long-term but critical to agriculture.

21. In view of the growing emphasis on greater accountability of Federal expenditures, do you have any suggestions as to how agricultural research results can be measured and their impact evaluated? Is there some standard of accountability for the efficient and effective use of Federal research funds?

As noted earlier, numerous studies have been conducted in the past 15 years that measured the impact of expenditures on agricultural research. The technology to measure this is in place. Efforts are underway to require researchers to address projected outcomes, impacts, etc. The process being put in place by GPRA does address the question.

22. What is the proper balance between in-house, formula funds, competitive grants, and special grants?

Again, a question for which there will never be a consensus on the answer. An important factor here is flexibility within and among the categories. The balance has, will and should continue to change due to needs and priorities. Each category is important in its own way in addressing long-term basic and applied research needs, special problems, short term needs, addressing catastrophic events, etc.

23. What guidelines should be used in determining appropriations for "specified programs" in research, education, and extension?

- User identified needs
- Evaluation of progress toward resolution of identified problems
- Breadth of the problem nationally
- Ability of the scientific community to address the problem
- Priority of the problem in Strategic Plans of the agency
- The impact of resolution and education on the population
- Does the country need people educated in the universities to address the problem over a long term?

24. Should Federal funds be used for programs only, or for facilities as well? If for facilities, how should they be allotted - competitive proposals or other? Is there a place for regionalizing research, increasing competitive grants, etc.?

It is appropriate to use federal funds for facilities on a matching fund basis. It would be very easy to set up a competitive review process based on national needs. Most funds for regional efforts should be devoted to programs and not facilities! A good mechanism for regionalizing research is in place through the Hatch Regional Research program, IPM, SARE, Water Quality, etc. These could use more funding, but it works well as a system. There is no apparent need to remodel this successful enterprise.

25. Is there a place for partnerships not only with state and local public sector organizations and industry, but also with private foundations?

Yes, and they are being developed every day. The best example is in the international arena. When federal programs were severely reduced in support of agriculture in developing countries, many universities established contracts and agreements between educational institutions. In some cases those agreements were directly with the developing country's government and a university in the U.S. Foundations, industry and public sector organizations are also involved in the agreements.

26. To what extent do self-assessed "check-off" fees on commodities provide resources for research and education? Do these/should these programs support long-term research, as opposed to short-term product development and promotion research?

Check-off fees provide a very important component to the overall effort. In many cases the infrastructure (i.e., facilities, scientists, etc.) are in place, but they lack sufficient funds to hire necessary pairs of hands (graduate students, technicians, etc.) and purchase supplies. The commodity funds often provide that little extra amount that makes the difference between getting the answer or not. The types of research supported by these funds are generally short-term in nature and probably will always remain so because it is difficult to get these folks to understand the benefits of long-term support. In some cases, a great deal of check-off funds are used for promotional efforts. It would be in the best interest of the industries if a greater portion were invested in research and extension.

Delivering Agricultural Research

27. In order of priority, what would be the most significant actions USDA could take to improve its management and/or delivery of agricultural research?

> Two recent actions, namely the reorganization of USDA and GPRA, are putting in place policies and management practices that address this question. As discussed earlier, strengthening the federal-state partnership in the area of planning would help. Specific actions that should take place are:
>
> - Bring the partners in at an earlier time to determine priorities, strategic plans, evaluation mechanisms, budgets and reallocation of resources.
> - Provide leadership in strengthening the research/extension relationship and responsibility at the state and regional level.
> - Reestablish a review program which may be structured more towards an accreditation systems with on-sight visits for competitive grants.
> - Expect a comprehensive plan of research and delivery in each grant proposal to ensure the distribution of information and recognition of problems.

28. What options should Congress consider to improve the delivery, results, and benefits of Federally funding agricultural research?

> There is precious little money available for developing new and innovative ways of delivering the newly acquired information and technology. Why not earmark a few dollars for developing innovative delivery systems? Extension is in an excellent position to help make this happen but does not have the resources. The benefits of agricultural research are well documented--do we really need to put great effort into trying to improve this aspect? With continual improvements in other areas this will take care of itself.

29. What should be the Federal role in ensuring training of future work forces for the food and fiber needs as well as the natural resource concerns of the public?

> The Federal Government needs to continue support of education programs at universities. The system for training our future work force is pretty well in place but, as usual, is chronically under funded. Continuing to fund the current Higher Education programs with some modest increases would serve our needs very well. These monies are distributed mostly as small grants that leverage significant effort and matching dollars. This is a good program that just needs to be nurtured.

Land Grant Universities

30. What is the continuing role of Land Grant Universities? 1890's Colleges? 1994 Colleges?

> There is no obvious need to change the basic mission of the 1862's. The manner in which they fulfill their mission obviously changes on an almost daily basis and this will continue. Much the same can be said for the 1890's. The 1994's are unique and their role will have to

evolve. At this point their emphasis should be on undergraduate education. They do not have the infrastructure to develop viable research and extension programs. To do so would simply dilute their efforts and nothing substantial would be gained.

31. Is the current formula used for allocating Federal funds to land grant universities fair, reasonable, and does it address changing conditions? If not, how could it be improved?

Good question — the formula does try to address the relative level and value of agricultural activity in each state. This may be as good a measure as can be devised.

32. The land grant universities have a system of agricultural experiment stations in each state. In today's environment of Federal and State fiscal constraints, is such an extensive system of research stations still warranted (please explain)? Could certain functions be merged with other USDA agencies, other Federal agencies, etc.?

The vast majority of funding for these stations is coming from the states. The system was set up to account for the various ecological zones and climates that are prevalent across the country. These have not changed, so the basic premise is still in effect. Merging the SAES with other USDA agencies or federal agencies is not a good idea, but co-location of USDA-ARS personnel with University personnel works very well and is a model that could be explored and expanded.

33. How can agriculture research be best coordinated among Federal, State, and private institutions?

Through partnering at an earlier time in the process of planning and program implementation. Coordination is not likely until the partnership is complete with participation throughout the process. The GPRA provides an excellent opportunity for that to happen. Congress can take a large step in ensuring such coordination by exempting the partners from the FACA rule.

34. What models currently exist, and are in use to provide regional cooperation in research and extension?

The Hatch Regional Research Program is well established and works efficiently. The regional SARE and IPM programs are more recent examples of programs that seem to work fairly well. Let them mature before trying some new system. Involvement of stakeholders is a key strength of these programs.

35. In the current era of constrained resources, is it appropriate to use Federal funds to promote cooperative regional research to reduce unnecessary duplication; and to what extent is it appropriate to use Federal funds to encourage consortia of states to establish individual centers of excellence to address common problems?

The current regional research program works very well. It exists because of modest federal support which leverages significant additional dollars. It would be very appropriate to use federal funds to support regional consortia and paper centers, not bricks and mortar.

36. As societal concerns about natural resource use, rural development, animal well being, etc. are integrated into the USDA agenda, is there a role for "new" partnerships with the Federal sector?

Certainly. These are being forged and developed. No special effort is needed to promote this other than to encourage CSREES and REE to provide leadership.

The USDA should function in a brokering role to bring together the interested parties to address the issues that all of us will face over time. The problems of the environment, animal welfare, rural development and revitalization are complex and will require a broad cooperative effort to bring resolution and understanding. The current agency structure with EPA, USDA, Interior, etc., all with some interest, cannot individually bring appropriate resolution. No one player should be left out!

37. Other parts of the Federal Government sponsor research directly applicable to the food and agriculture system. The National Science and Technology Council is intended to address the coordination of related activities across agencies. How is this intended to work in the case of research and extension on food and agriculture? How well is it actually working? Are alternative methods needed?

One might be hard pressed to name one significant accomplishment of the NSTC as related to research and extension on food and agriculture. The process being used to develop a research agenda does not appear to involve the broad research community, i.e., universities, colleges and limited stakeholder input. The relationship with USDA needs to be strengthened.

National Research Initiative

38. Congress authorized the National Research Initiative (NRI) Competitive Grants Program at $500 million per year. If the NRI is to be fully funded, where in the USDA research budget could money be transferred from?

Why does it have to come from the USDA research budget? Has the decision been made that the research budget is as large as it needs to be? Recent information provided by NSF in its annual R&D investment update would appear to suggest that the Federal investment in Agricultural R&D should be doubled when compared to overall R&D investment. A study on the appropriate long-term investment in agricultural R&D is needed. The agricultural research community is very appreciative of efforts by Congress to fund research and education but is concerned that the overall investment is not adequate.

39. What other options for funding the NRI should Congress consider?

Perhaps establishing a trust fund with tax deductions to the private sector who contribute; industries tax themselves on products both domestically and internationally.

40. Have NRI appropriations been used to expand agricultural research or have they been used to continue existing programs?

Agricultural research has been expanded significantly by the NRI. This has been a very successful program. Adding this expanded research component will serve agriculture well in the future.

Agricultural Research Service (ARS) Laboratories

41. Should the USDA have research laboratories or should it provide competitive funding to existing entities such as universities?

> The USDA laboratories fulfill several very specific needs. They are mission oriented and driven. It would be difficult to transfer these efforts to universities and get the same results, however, co-location as noted earlier would be very appropriate. The key is to have joint ARS-university planning efforts to maximize the efficiency and strength that each offer in addressing the complex needs of agriculture.

42. Should more ARS laboratories be co-located at land-grant universities? What should be the relationship between ARS and land grant university scientists? Between ARS research coordination? How can ARS laboratory functions be more effectively linked to State Agricultural Experiment Stations?

> Co-location should be encouraged whenever possible. The relationship should be one of partnering whenever possible. The linkage needs to be mostly informal with a minimum of bureaucracy. Co-locate the scientists and provide them with the flexibility to build collaborative efforts. They will coordinate and work together very well.

43. Are ARS laboratory facilities effectively used in performing needed research? If not, please explain and offer suggestions for better use?

> They are doing very well and they are making a concerted effort to work with universities and listen to their customers.

Extension Service (Extension functions within CSREES)

44. The USDA Extension Service's (ES) mission is, among other things, to disseminate research results to farmers and other customers. In your opinion, is the ES effective in carrying out this mission (please explain)?

> Generally, yes. ES has made and continues to make positive and major changes. They are recognizing a change in customers, their needs, and are developing improved ways to deliver information within the resources available.

45. Should the ES be involved in addressing the problems and challenges confronting urban populations?

> Yes, at least to some extent. The challenge is striking a balance. Extension has been asked at the local, state and national levels to assist in bringing the capabilities of the total university to the broader constituencies. This is an appropriate role for extension. The key is that ES has not expanded its role at the expense of agriculture.

46. What if any role should ES play in dealing with the social issues facing farmers and rural communities?

The social issues are as important as the economic and technical issues. A certain level of activity in this area needs to be maintained. Social sciences are an integral part of the university and these capabilities need to be shared with people of the state.

47. Should the ES's mission statement be changed to focus activities on production agriculture?

It certainly needs to be a prominent part of their mission statement. Of import is to remember that agriculture touches everyone's everyday life.

48. What should ES not be involved in?

ES is supported at the local, state and federal level. The needs of people are different within and among counties. ES needs the flexibility to address needs of a broad, diverse community.

Dissemination of Research Results

49. Do you have any suggestions on how USDA's dissemination of Federal agricultural research results can be improved?

See the answer to question 28.

50. Who is, or will be, responsible for developing a marketing plan for agriculture and its science and education programs to the American people?

The existing system of marketing cooperatives, brokers and wholesalers are among those who develop the marketing plan. Aside from regulation governing amount of production of certain products, quality, and health, there is little that the federal government can or should do with respect to marketing. Public and private support of a shared vision for agriculture would be desirable.

Current Research Information System (CRIS)

51. ARS uses CRIS to provide information about USDA research projects. How, if at all, do you use CRIS?

As a source of information and to determine current research efforts in order to prevent duplication. Also, to find experts working in the field. To determine where collaborative research is being done, or where it could be done. Useful in project evaluation.

52. In your opinion, is CRIS effective in helping you obtain information on Federal agricultural research projects? If not, what changes are needed to this information system that would provide quality data on Federal and State agricultural research (please explain)?

It works well for the purpose for which it was designed. Some now want it to be the means for transferring technology to the public. It was not designed for this use and it will not work in this manner. CRIS should be left alone to serve its current function and some new/different system needs to be developed for the transfer of information to the public.

> Several recent studies have identified ways to improve CRIS. A modest amount of resources (one-time) to upgrade and remodel CRIS should be considered.

53. Is there/should there be an appropriate and adequate management information system(s) in place to report and collate results from Federal investments in research, extension, and higher education sponsored by the USDA and related research agencies?

> No system is in place but yes, one very definitely is needed (see latter comments above - question 52).

54. Does the CRIS system and other USDA reporting systems provide an adequate accounting of the research and extension work that is being done in America?

> It provides an adequate accounting, but it will never be the answer to question 53. The questions raised in 53 need serious attention.

International Relationships

55. How can the USDA be most effective in the short and long term through its support of international activities?

> USAID is obviously getting out of the foreign assistance business as related to agriculture. USDA should look aggressively at picking up some small part of this function. Partnership with the private sector on international activities should be explored.

56. Currently, USAID and other programs extend agriculture and agricultural development beyond the nation's borders. What continued or expanded role should USDA play in international research, education, and extension?

> Some expanded role is warranted. The private sector, academia and the government need to build a common strategy for addressing this question.

57. What is the role of USAID in funding agricultural research and extension? Has USAID maintained support for agriculture or has the agency moved away from agriculturally related programs? What is the role of long-term agriculture R&D in developing countries in developing new markets for U.S. products?, Should USAID contract through USDA/REE for long-term agriculture R&D?

> USAID has definitely moved away from support for agricultural programs. Contracting through USAID is an interesting and intriguing idea, but will they have the means for support and commitment to such an effort? Currently there is a "gaping hole" in U.S. international agricultural research, extension and education activities. It appears that some agency needs to take a leadership role to ensure that we as a nation have a presence in both developed and underdeveloped countries.

NORTH CENTRAL ASSOCIATION OF
AGRICULTURAL EXPERIMENT STATION DIRECTORS

Office of the Executive Director

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October 26, 1995

The Honorable Pat Roberts
Chairman, Committee on Agriculture
The Honorable E. (Kika) de la Garza
Ranking Minority Member, Committee on Agriculture
The Honorable Wayne Allard
Subcommittee Chairman, Committee on Agriculture
The Honorable Tim Johnson
Subcommittee Ranking Member, Committee on Agriculture
U.S. House of Representatives
1301 Longworth House Office Building
Washington, D.C. 20515-6001

Gentlemen:

This is a response to your letter of July 12, 1995 and the "open ended" list of discussion questions regarding Agricultural Research, Education, and Extension. The questions were shared with the North Central Regional Association of Agricultural Experiment Station Directors (NCRA). The collective responses of the 12 NCRA directors and their staffs are represented in the attachment and I am pleased to forward them on their behalf.

We believe that your list of questions was complete and covered the important issues, thus we have not added to the initial list. The NCRA appreciates the opportunity to take part in this evaluative process. We also appreciate your concerns for this nation's agriculture and your leadership in these most exciting and trying times. We trust that you will contact us if you have additional questions concerning the Agricultural Research, Education, and Extension System. Thank you.

Sincerely,

R. L. Lower
Executive Director

RLL:ma:oct

Attachment

AGRICULTURAL RESEARCH, EDUCATION, & EXTENSION
QUESTIONS FOR DISCUSSION

Federal Agriculture Research Goals

1. What should be the role of the federal government in agricultural research?

The federal government should play a major role in supporting agricultural research because many of the high priority issues are of regional or national scope or both. These issues cannot be adequately addressed by an individual State Agricultural Experiment Station (SAES). Many farms, ranches, and agribusinesses are small operations that depend on publicly-financed (both state and federal) research to keep their operations profitable and competitive. At the same time the public research support is imperative to keep agriculture competitive in the international arena.

The state-federal partnership in agricultural research has been the catalyst for ensuring that U. S. citizens have access to high quality, nutritious and low cost food and fiber products. Yet, today's agriculture is much more than products. Agriculture interfaces with food and nutrition, environment and the natural resource base, and rural and urban development.

The federal government should continue to provide base funding special and competitive grants to satisfactorily address the national needs. Base funds support research that protect program continuity (as well as planning and coordination) in areas of research where quick solutions are rare and funding opportunities are intermittent at best. Base funds keep the research system operational, provide a mechanism for quality control and also insure long-term viability of the agricultural and related industries. Special and competitive grants support research on more defined areas that range from the very applied and of short-term duration or, to the other extreme, very basic, high risk and long term.

There is also a need to support the research capacity of the USDA/Agricultural Research Service (ARS). The ARS attacks major problems of national scope. Their laboratories are regionally located and this geographical dispersal also allows for synergistic responses from joint programs with the SAESs when their facilities are in the same vicinity.

2. To what extent should goal setting and goals in agricultural research be cognizant of and coordinated with research activities in the rest of the federal research sector (HHS, EPA, DOE, etc.)?

Ideally, goals and goal setting should be coordinated throughout the federal research establishment in areas where interests are related. It would also be desirable for federal agencies to coordinate and jointly fund programs that relate to the missions of more than one agency. The appropriate level within USDA for coordination of goal setting is at the Under Secretary for Research, Education and Extension (REE).

Although there may be considerable overlap between research goals in the agricultural sector and those of other federal agencies, that overlap and common objectives and goals must be recognized as important to providing appropriate coverage of research. The Office of Science and Technology Policy (OSTP) offers a mechanism for the much needed interagency coordination. The coordination would assure adequate direction of the research programs and help avoid unnecessary duplication. The USDA and the SAES system is best positioned with both human and physical resources to address the planning, coordination and conduct of agricultural research.

3. Is the process associated with the Food Animal Integrated Research for 1995 (FAIR '95) adequate for the development of federal agriculture research goals? Are there goal identification processes which might better serve to enhance federal agricultural research other than FAIR '95?

The process used for FAIR '95 resulted in the identification of appropriate goals for food animal agricultural research. A strength of the process was the extensive involvement of the animal production and processing industries. It is uncertain that other stakeholders such as consumers and environmentalists were involved in the process. Thus, the process was acceptable, however the subject matter was limited as was the expertise of the participants. Another example of a FAIR '95 planning process is that of the Plant and Soil Science Forum. The input process used for developing the 1994 Experiment Station Committee on Organization and Policy (ESCOP)-Cooperative State Research Service (CSRS) Strategic Plan embraced a very broad range of stakeholders. It is anticipated that the process to be used for implementing the Government Performance and Results Act (GPRA) by the Cooperative State Research, Education, and Extension Service (CSREES) will engage all users of the research system.

4. If the process of FAIR '95 were to be used to adopt an agenda for federal agricultural research, how would the goals identified in FAIR '95 and listed below, need to be modified to address the concerns of all research stakeholders?

1) Enhance industry wide responsiveness to consumer and societal concerns;
2) Meet market demands through increased efficiency and competitiveness;
3) Develop integrated food animal management systems;
4) Maintain and enhance environmental quality;
5) Improve food quality control in terms of safety, desirability, and nutritional composition; and
6) Enhance animal well-being throughout the life cycle of food-producing animals.

Three of the six goals identified by FAIR '95 are specific for animal agriculture. These goals should be broadened to include other production systems. Additional goals should be added that relate to plant agriculture, management of natural resources, rural community development, development of new uses for agricultural commodities, improved human nutrition, sustainable production systems and waste management. Also, the planning group and participants in the process must represent the broad set of constituencies.

Priority Setting

5. Is federally funded agricultural research focused on the issues of highest priority for producers, processors, and consumers? If not, how can the priority setting mechanism be improved to insure that these issues are addressed?

> Much of the research currently underway is focused on high priority issues. The ESCOP strategic planning process, in partnership with CSREES, relies on broad inputs from SAESs that are based upon contributions from all facets of the user community.
>
> Most SAESs work closely with constituents (producers, processors and consumers) to review immediate and long-term needs. Most university departments have advisory committees made up of user community representatives that meet directly with SAES directors. In addition, individual faculty members cooperate with constituents to review and establish priorities for their research programs. SAESs also work closely with one another in defining areas of mutual need and jointly conduct regional research that capitalizes on the talents of scientists in neighboring states.
>
> Some very important basic science programs are established as high priority by the SAES directors and their scientists. Although these projects are judged independently and without direct input from the constituency, they are of great import in the establishment of discovery or fundamental science that undergirds the more applied research.
>
> It is important that projects addressing state priority issues also qualify for federal resources. Issues will arise in one or a few states that are very important for a region but will not be a national priority.
>
> The current peer review procedures used in the approval process for all agricultural research projects is designed to insure that research is relevant and has scientific merit.

6. Should federally funded agricultural research address specific technological and industrial needs? If yes, does the present system fulfill this goal (if not, please describe how this can best be accomplished)?

> Fundamental research and verification of scientific concepts related to new technologies are missions of SAESs. Private industry is best suited to development and commercialization of products that result from SAES research. Private agricultural research is focused on development of new food products, processing technologies, and production inputs (vaccines, feed, seed, pesticides, medicines, etc) and short-term projects that have a high probability of success. Private industry does not frequently invest in high cost, high risk fundamental research, research on practices that improve production efficiency or reduce amounts of purchased inputs, or on development of integrated systems.
>
> Public agricultural research has been a major force in improving food and fiber production efficiency and lowering food costs for consumers. In the future, SAESs will

have closer relationships with private industry so that the research, development and commercialization processes are more tightly linked and efficiently implemented. These linkages will allow technologies to reach the producer and processor in a more timely manner and improve the competitiveness of American agriculture.

Mechanisms to develop joint research support from industry, state and federal government are in place in some regions. An example is the Midwest Plant Biotechnology Consortium (MPBC) which leverages dollars from both the public and private sectors to conduct high priority regional research.

7. Does federal agricultural research adequately address projects that result in quantum leaps in benefits, or does it dwell too much on incremental benefits?

Although there have been quantum leaps such as those associated with mechanization, the development of hybrid corn and use of nitrogen fertilizers, agriculture is a mature industry that has developed incrementally over the past 140 years. Biotechnology and information sciences represent tremendous opportunities for improving the yield and quality of agricultural products and reducing production risks. These advances will likely occur over time rather than as quantum leaps.

Federal formula funds are integrated with other sources of funding such as state and industry to support research programs that usually result in incremental benefits to the constituents. In addition to the formula funds, the special grants, the National Research Initiative (NRI) and other competitive funding which addresses specific needs may result in incremental gains, but will only rarely achieve a quantum leap.

Agricultural research has adopted new technologies in a responsible manner as shown by the rapid implementation of molecular biology into SAES research projects. Integrated crop and pest management programs utilize biotechnological breakthroughs in combination with traditional research such as biological control, host resistance and application technology. Agricultural researchers have quickly adapted military global positioning and geographic information systems technologies into a site specific (precision) farming programs.

8. What is the appropriate role for USDA-REE in insuring competitiveness in the face of decreases in price support programs?

The U.S. must stay at the forefront of agriculture by continuing to discover and apply new technologies that will maintain the global competitiveness of its agricultural industry. Research and education are key elements in making U.S. producers and processors competitive in the world marketplace. We must develop and disseminate new technologies and practices that lower the per unit cost of our products so we can compete and provide a profit for the producer and processor. We must find new uses for agricultural commodities and export a much greater proportion of our commodities as higher value products. USDA-REE is key to carrying out these mandates through focused research and effective education programs. The proposed Agricultural Competitiveness Initiative (ACI) is an example of legislation that can benefit producers and consumers in the face of decreased price supports.

9. How can the appropriate federal-state-industry resource pools be integrated to develop high priority regional programs in research, teaching, and extension?

The SAESs and the Extension Services (ESs), along with their regional associations, are in an ideal position to integrate federal-state-industry resources to address high priority programs in research, teaching and extension and they do this routinely in some states. The integration of USDA-Agricultural Research Service (ARS) researchers into these joint activities is variable. In some cases the ARS employees are located at university campuses and participate directly in the joint projects with other scientists. When located off campus, the participation pattern varies with each location. The level of ARS participation in the prioritization and planning processes is limited when scientists are located at sites other than university campuses or outlying field stations. Similarly, SAES and ES scientists and their administrators have limited input into ARS priority and program planning. However, this limitation is not related to physical distance as much as to differing views of the ARS administration regarding outside input into their prioritization and programmatic activities.

The CSREES Regional Research Program is an example of the federal-state partnership working on a regional basis to attack problems of significance to more than two states. In some cases, industry funds are obtained by one or more of the participants in regional research projects to enhance the ongoing research. Some states are forming partnerships with neighboring states to carry on specific high priority projects and share expertise. In many cases, resources ($, FTE, etc.) are shared across state lines.

Many of the individual research projects in each state are carried out by a combination of federal Hatch funds, state appropriations, and industry grant funds. This aggregation of resources is important in times of declining public funds. There is a need to establish more partnerships for funding agricultural research. Hopefully, industry will understand that significant benefits will accrue to them as a result of the partnership.

10. How important is the federal agricultural research role in supporting other agencies of USDA? Of other federal agencies? Could this be done more efficiently and at a lower cost?

ARS has traditionally been the USDA entity that was assigned responsibility for conducting research in support of action agencies such as Natural Resource and Conservation Service (NRCS), Food Safety and Inspection Service (FSIS), and Animal and Plant Health Inspection Service (APHIS). In recent years, the action agencies have been turning to SAESs for more of their information needs. As ARS resources are constrained in upcoming years, we feel that SAESs will be called upon to provide additional support for USDA action agencies. It would not be cost effective to set up research components in the action agencies but it would be desirable for the agencies to have adequate funding to contract with SAESs for specific research.

SAESs have received grant and contract funds from a wide variety of federal agencies (USEPA, DOE, DOD, NASA, NIH, NOAA, USGS, BLM, FWS, etc.). It has been very cost effective for federal agencies to contract with SAESs for research because the quality has been high, overhead costs are low, and the research process had educated and developed competent scientists who may be employed by the agencies after completion of their degrees. It is hard to imagine that another approach to research could be more efficient or less costly. Also using SAES scientists in these research programs enables the direct transfer of the new knowledge to both undergraduate and graduate students. This is a direct payoff in the development of human resources.

Perhaps the most obvious support of SAESs and ESs to other agencies comes in research that addresses social and human issues, including human nutrition, housing, child care, budgeting, etc. in both rural and urban settings. The state extension services have an extensive network for determining needs and delivering information and services, while the SAESs work in concert with extension to conduct research appropriate to the problem areas.

Additionally, agencies such as EPA are dependent on sound unbiased information in making determinations about needed regulatory practices and other related matters. The SAESs are well placed and have the expertise and infrastructure to conduct research on timely issues for other federal agencies.

11. USDA reorganization created the Cooperative State Research, Extension and Education Service (CSREES). In your opinion, how should this newly configured agency function to support the U.S. agricultural enterprise, 1995-2002?

CSREES must provide services to the land grant universities and be a vehicle for coordination and intellectual leadership. CSREES should focus efforts on: (i) joint visioning and strategic planning with SAESs and ESs to identify and prioritize issues; (ii) liaison with other federal agencies to plan and create jointly-funded research programs on high priority issues; (iii) coordination of national high priority research programs including joint efforts with ARS and other agencies; (iv) fostering development of linkages and partnerships between SAESs, the SAES system and federal agencies, and the SAES system and private industry; (v) providing the interface between the SAES system and congress, executive branch agencies, and other decision makers.

12. What is the proper place for integrated systems programs? What role should the Extension Service (extension functions within CSREES) play in these programs?

During the next decade much of the applied and adaptive agricultural research will focus on integrated systems. The research will be carried out by interdisciplinary teams of scientists and will increasingly involve producers as team members. These research programs will be very broad in scope encompassing all aspects of the system, i.e., crop and animal production, natural resources management, and social dimensions. The ES will play a key role in demonstrating how integrated systems are established and managed and in educating producers about the dynamics of integrated systems. Integrated systems are very knowledge and management intensive and, thus, a greater degree of sophistication will be needed in the educational program delivered by extension. Extension specialists will be highly involved in the planning and conduct of integrated systems research.

Advisory Boards

13. Have USDA's research and extension advisory and coordinating boards been effective in planning and prioritizing agricultural research and extension? (please explain)

The USDA's research/extension advisory and coordinating boards have been somewhat effective in planning and prioritizing agricultural research. In general they have sought input from commodity and user groups and the SAESs and ESs. These are useful exercises. However, we have too many overlapping groups involved in the planning process and streamlining will improve the process. Also, more attention should be placed on quantifiable measurable goals in setting priorities for research and extension in a 5- or 10-year plan.

14. How have research or extension priorities been changed as a result of the recommendations of advisory boards (please provide examples)? Are there presently too many advisory boards?

The water quality thrust in the '80s and '90s provides an excellent example of how research and extension priorities have changed in response to advisory board recommendations. These recommendations led to significant redirection of AES effort, and had a very beneficial national impact. Another example is in the area of integrated pest management (IPM) where advisory board interest and recommendations to reduce the use of agricultural chemicals has led to increased use of biological controls and continued search for host resistance and alternative control measures.

As mentioned under question 13, there are too many advisory boards with overlapping responsibilities. This duplicative effort tends to fragment and weaken the process and it also interferes with the timeliness of the recommendations. However, there is a need to involve a broad representation of the constituency to build consensus and to participate in the planning process for research and extension.

15. What options should congress consider to improve USDA's process for planning and prioritizing agricultural research? (i.e., how should the research agenda be prioritized?)

In the future, congress should consider obtaining simultaneous scientist and user input in the priority setting process for agricultural research. Currently, input is sought separately and the benefits of provider-stakeholder interaction are not achieved.

In some states the agricultural research planning and prioritizing process involves both SAES personnel and members of the user community. Utilizing state inputs to develop regional priorities and plans and then building on these regional processes to put together a national plan would allow for identification of the country's immediate and long-term needs for agricultural research.

Options that congress should consider in improving USDA's process for planning and prioritizing agricultural research should include not only the CSREES, but the USDA-ARS as well. The ARS has been defining priorities for agricultural research mainly in a vacuum when it relates to the involvement of the SAESs.

16. What role should stakeholder advisory boards play in setting the agenda? What groupings should be represented on advisory boards. Can "customers" and "partners" be accommodated on one board or will it require two?

Customers and partners can and should be included on the same advisory boards. The researchers must listen to the customer. Stakeholders challenge the scientists and provide real-world input in priority setting. Ultimately the scientists and science benefit from this interaction. The scientists must make the final decision on what research is technologically feasible to pursue.

Choosing advisory board makeup is a difficult task. Many states have diverse industries and interests and honoring all of their "users" is impossible. However, it is possible to listen to all and then move ahead with a representative group of state persons to assist each state in building its research agenda. The same procedure should be used to develop regional and national agenda.

The role the stake holder advisory boards should play in setting agendas is by defining an advisory role not a regulatory role. Representation on the board should include a broad spectrum of producers, processors, and consumers of agricultural products.

17. Is there a special role for advisory boards to play in international agriculture beyond what has occurred in the past?

With reference to international agriculture, Title XII is working well. There is a relatively small role for advisory boards to play in this arena. We must be careful to recognize the effects of our research on the international community and consider their responses to new production techniques and the like, especially if the research were to lead to increased global competition for our constituents.

Thus, there may be a special role for advisory boards for international agriculture related to marketing and product development. The new technology developments in telecommunications should have instrumental roles in helping to define the international agricultural research and extension agenda.

Funding Considerations

18. What is the most appropriate mix of federally funded basic and applied agricultural research?

A mix of federal funds is extremely important to the conduct of agricultural research and the mix will vary according to each state and their sources and levels of support. However, from a general standpoint, the formula funds are critical to all states as they serve as the base support for both applied and basic research and are vital for maintaining continuity. These funds allow SAESs to research local, state, regional, and even national priorities and to merge or integrate other sources of support such as state or industry dollars into the programs.

Special grant (USDA) and competitive grant (from USDA and numerous federal agencies) programs are vital to the support of research on specific priorities as identified both regionally and nationally. Many of the special grant programs are designed to solve problems of a regional nature and they may be of either basic or applied nature, or a combination of both, and will likely leverage outside support from industry. Some states are richer in human resources and compete better for competitive funds than other states because of this inherent wealth. Thus, the role of competitive funding differs with each SAES, although competitive funding usually supports basic research.

One-half to two-thirds of the benefits of basic research funded by any single state spills over into the other 49 states. Thus, each state will tend to under fund basic research unless the federal government pays for the cost of producing the benefits that flow from the funding state.

Applied research also spills over to other parts of the U.S. from any funding state, but to a lesser extent. While spill overs vary greatly by commodity and region, up to one-half of the benefits spill out of any state's investment.

19. How, if at all, can the effectiveness and efficiency of agricultural research be enhanced at current funding levels? At reduced funding levels?

Effectiveness and efficiency at either current or reduced levels is possible only by increased emphasis on planning and coordination at local, regional, and national levels to decide which specific programs are most critical. Even funding at current levels requires increased planning as inflation continues and will result in downsizing due to loss of real spending power. Thus, if quality programs are to continue it will be necessary to increase efficiency and reduce or eliminate some priority programs. An alternative is to look for additional sources of funding.

20. How can future funding be determined and justified so as to permit multi-year programs be completed.

Long-range planning programs like the SAES Strategic Plan identify the research agenda for the agricultural and related sciences on a four-year basis. This plan represents the efforts of the station directors and their staffs and is complete with recommendations about the level of scientist involvement necessary to conduct the priority research deemed justified. Since all of these priorities are multi-year in duration, they could serve as the base model for identification of funding needs and develop the necessary time frame for startup and duration of research programs.

The formula funds that provide the glue and continuity to SAES research programs should continue and should grow at at least the rate of inflation. These funds are key to maintaining multi-year projects as they serve as a bridge for startup, interim or year-end funding when other sources fail.

An important facet of research support is the stability of funding. Rapid increases and/or decreases in funding levels creates inefficiency and uncertainty. These changes can empirically demonstrate lost productivity when compared to stable funding at a slow, steady rate of growth that exceeds inflation. Large, unpredictable change in funding levels reduces research productivity and the productivity of agriculture. Hatch formula funds have been a primary source of stable federal funding.

21. In view of the growing emphasis on greater accountability of federal expenditures, do you have any suggestions as to how agricultural research results can be measured and their impact evaluated? Is there some standard of accountability for the efficient and effective use of federal research funds?

There are numerous measures of accountability at nearly every SAES, however, they are not uniform enough to be meaningful on a national scale since each station conducts its business in a slightly different way than does its neighbors. Thus, we are hopeful that the GPRA will result in a standardized model that will serve the government and its states well in measuring inputs and outcomes. To date, we do not have a database that will accommodate an accounting system that truly measures research inputs and outcomes.

The need for greater accountability must be balanced by costs of the accountability systems, where possible. Proposals should also include a quantitative analysis of the social benefits of the research. Return on investment is one good index of accountability, but social considerations may be very difficult to quantify.

22. What is the proper balance between in-house, formula funds, competitive grants, and special grants?

The combination of formula funds, competitive grants and special grants provides an ideal mix of funding alternatives needed to support agricultural research. Formula funding is the only reasonable way to fund adaptive and maintenance research. Special and competitive grants are most appropriate for basic research and for applied research with clear and direct goals.

The balance is different for each of the states as their resources come from so many different sources and in varying percentages. State funds (appropriations) should serve to cover the costs of faculty, base staff and their needs for base support (benefits, physical plant, day-to-day costs of the base program). Little research is actually paid for by state appropriations beyond the level noted above and these resources are becoming scarcer with each new year. The federal formula funds that are so important to the research program of an AES make up a varying portion of each state's budget. In some states as little as 5-10%, while in others as high as 25-30%. The state appropriations supply the continuity for the human resource and the formula funds the continuity for the remainder of the research program. Special and competitive grants are awarded on the basis of merit and the range of budget contribution is as high as 30-40% and as low as 5%. Thus, it is difficult to identify a "proper" balance as what is optimum or favorable for one state may be inadequate for another. SAES size (FTE) and the size of the state's population and its agricultural value are inherent and important components of each state's makeup and play a major role in the determination of this complex balance.

It is clear that all SAESs would favor full funding ($500 million each) of both Hatch and the NRI.

23. What guidelines should be used in determining appropriations for "specified programs" in research, education, and extension?

Assuming that "specified programs" are those funded by special and competitive grants like the NRI, the guidelines should be developed on the basis of state, regional and national planning and prioritization. Guidelines should be in place that allow for funding of a priority or designated need that fits within the various plans and is without adequate support.

Funding for "specified programs" in research, education and extension should be based on: 1) the urgency of the problem, 2) the extent that the problem is not being effectively addressed by other segments of the scientific community, and 3) whether it is a large regional or national problem that tends to be ignored or under funded from other than federal sources.

There is a well-defined need for special grants. Unfortunately, it is not always possible to predict or to "sell" funding agencies about the research need until an emergency or crisis situation occurs (i.e., corn blight, *E. coli*, white fly and wheat aphid). A research pool to address unidentified urgent needs is unlikely in today's funding environment. However, giving the USDA the flexibility to respond to a crisis via a research contract has been discussed and has considerable merit.

24. Should federal funds be used for programs only, or for facilities as well? If for facilities, how should they be allotted - competitive proposals or other? Is there a place for regionalizing research, increasing competitive grants, etc.?

At present, with fiscal constraints facing both state and federal governments, it is appropriate that federal funds be used for research support. The states should have the responsibility for furnishing the SAES scientist with the necessary research facility. When a specific research need is identified that may have relevance to a specific geographic area, it would be appropriate for the state and federal governments to cost share a new facility if a satisfactory one was not available. This type of regional facility might be best funded through a competitive regional grant program.

25. Is there a place for partnerships not only with state and local public sector organizations and industry; but also with private foundations?

Yes, there are partnerships between state and local public sector organizations and industry. There is definitely a place for partnership with a private foundation as long as goals of all the participants are in common and not compromised. The primary role of the public universities is to produce the public goods that the private sector cannot or will not produce.

26. To what extent do self-assessed "check-off" fees on commodities provide resources for research and education? Do these/should these programs support long-term research, as opposed to short-term product development and promotion research?

> Commodity "checkoff" support is already important and is likely to grow and become even more important in the future, particularly if other sources of funding shrink. However, these funds are tightly linked to industry goals and we are always monitoring the usage and preserving the SAES right to conduct the research that we deem appropriate. Although it is certainly the goal of most commodity funding to solve problems that are short term, it is possible to leverage commodity support for long-term programs such as breeding for increased disease resistance.

Delivering Agricultural Research

27. In order of priority, what would be the most significant actions USDA could take to improve its management and/or delivery of agricultural research?

> Develop a common research priority and planning process that engages the principal players, the SAES-CSREES and the ARS. Perhaps other agencies and departments (i.e., U.S. Forest Service) should also participate.
>
> Develop a closer working relationship or partnership between the USDA and the extension services in the states to enable transfer of research results to the appropriate clientele.
>
> The USDA should develop a Management Information System (MIS) that is state-of-the art that would allow for accurate tracking and immediate retrieval of research, education and extension program results. Data such as programmatic areas, priorities, goals, support costs (Current Retrieval Information System (CRIS)), deliverables and projected outcomes should be easily accessed.
>
> A key action that USDA could take is to select and support a few specific areas that are real national priorities for each round of competitive grants.

28. What options should congress consider to improve the delivery, results, and benefits of federally funded agricultural research?

> Options congress should consider to improve the delivery, results and benefits of federally-funded agriculture research would be the involvement of the consumer and the processor of agriculture commodities in the formulation of the research agenda.
>
> Emphasis should be placed on partnerships with industry so that new technology is delivered to benefit the consumer, but the public investment must be protected.
>
> Congress should develop a streamlined process for formulation of the research agenda in which all segments of the agricultural community are represented. This would greatly aid defining the delivery and benefits of federally-funded research.

The MIS program described in question 27 must be implemented to support the above options.

29. What should be the federal role in insuring training of future work forces for the food and fiber needs as well as the natural resource concerns of the public?

The federal role in training the future work force in agriculture and natural resources should be one of a strong partnership with the states. The work force will be increasingly mobile, and life-long learning will become the norm. The federal role should also be to encourage interstate distance learning.

The federal role in insuring the training of work forces for food and fiber needs, as well as the natural resource concerns of the public, should be founded in broad educational programs. These programs would start at the elementary school level and define agricultural research and identify the benefits to all of us. The programs should continue through the elementary schools, high schools and university and adult education projects. The most successful programs are those that demonstrate the role agriculture plays in everyday lives. This activity should not be limited to agricultural production but also include the maintenance of natural resources as related to environmental quality.

Training the human resource necessary to support the agricultural and natural resource infrastructure will require an infusion of new funds at both undergraduate and graduate levels. Also, life-long commitments to the areas of agricultural and natural resources must be shown as challenging and rewarding.

Land Grant Universities

30. What is the continuing role of Land Grant Universities? 1890's Colleges? 1994 Colleges?

The role of the land grant universities is to provide a coordinated effort to generate knowledge and technology that is passed on to its student clientele, customers and business constituents that allows them to enjoy a satisfactory quality of life and to be competitive in global markets. Although the clientele groups change, the roles of the 1890 and 1994 institutions are similar.

31. Is the current formula used for allocating federal funds to land grant universities fair, reasonable, and does it address changing conditions? If not, how could it be improved?

The present system is time-tested and worthy of continued use in the view of most SAES directors. Adjustments could be considered every decade but anything less than that time-wise would be subject to the vagaries of markets, climate and world conditions that may not reflect adequately on the real situation regarding state and national agriculture.

The current formula tends to give an advantage to states with a large number of small farms and a relatively large rural population. Some believe that consideration should be given to weighing farm gate receipts as well.

32. The land grant universities have a system of agricultural experiment stations in each state. In today's environment of federal and state fiscal constraints, is such an extensive system of research stations still warranted (please explain)? Could certain functions be merged with other USDA agencies, other federal agencies, etc.?

An extensive system of research stations is necessary to address the research needs of states with varying geography, geology and climate. In major agricultural states, it is important to have research data on commodities, particularly as the decline of the farm program looms on the horizon. Currently, these research stations are used for cooperative research with USDA, federal and state agencies and the private sector.

The SAES system has and continues to serve state, regional and national needs well. The present system allows for immediate response to local problems and addresses both short- and long-term needs of the state in a timely manner. The state AES mission is to conduct research that enables the state's citizenry to effectively utilize its resources, while preserving/improving its quality of life.

There is general agreement that with the economic situation described in the question and the similarity of needs in many states that the public is best served by regionalizing individual programs that are similar and can be effectively linked. The sanctity of state borders is disappearing and many states have already joined together and share resources to solve common problems.

Regional opportunities for coordinated research supported by federal agencies are being developed or encouraged by the SAESs at nearly every planning meeting. Examples include research on IPM, environmental quality and water quality. Although it is sometimes difficult to bring the funding agencies together to discuss these joint activities, it is becoming more common and the opportunities are increasing yearly. Having a joint federal research agenda (as suggested in the answer to question 28) is a positive step toward improved planning and prioritization of research needs on both regional and national scales.

33. How can agriculture research be best coordinated among federal, state, and private institutions?

Initially it would be important to insure that the USDA has brought both ARS and CSREES (see question 27), as well as other units that fund research activities, to the planning table. The USDA must take the lead in coordinating the federal effort. The SAESs will inherently be involved through their affiliation with the USDA-CSREES. Private institutions would likely respond to any invitation that would encourage their participation in a national research program. They may best be contacted or represented through NASULGC.

34. What models currently exist, and are in use to provide regional cooperation in research and extension?

The current regional research program (formula funded through RRF) involves formal research coordinating committees (including extension scientists) and administrative oversight. This program is an excellent model for providing regional and inter-regional cooperation across state boundaries. The concept is sound and provides the opportunity for addressing research needs on a broader basis than by individual AESs. These activities reduce redundancies and also bring together scientists with varying viewpoints and this contributes positively to problem solutions. Currently, at least 25% of formula funds (Hatch-RRF) support regional research.

Although extension is not as formally organized within and between regions as are the SAESs, recent breakthroughs in coordinating research and extension activities in IPM research and technology transfer bode well as a model for continued joint research/extension coordination.

The North Central Region is presently prioritizing its regional research needs on the basis of input from the department chairs/heads in the land grant colleges of agriculture of all 12 states. We believe that developing research priorities at the department level allows for cutting edge input and relates to real teaching, research and extension needs.

35. In the current era of constrained resources, is it appropriate to use federal funds to promote cooperative regional research to reduce unnecessary duplication; and to what extent is it appropriate to use federal funds to encourage consortia of states to establish individual centers of excellence to address common problems?

See question 34. Also, there is justification for the use of federal funds to encourage development of centers of excellence. These could be regional or represented by a concentration of expertise or particular production or urban or geologic area, etc. that is specific to a high priority research opportunity.

36. As societal concerns about natural resource use, rural development, animal well being, etc. are integrated into the USDA agenda, is there a role for "new" partnerships with the federal sector?

As discussed in questions 27, 33, and 34, the development of new federal partnerships for the expanding role of agriculture and natural resources to include the environment, families, youth and rural development is not only a good idea, it is mandatory to both good research planning and to fiscal responsibility. Support in several of these areas is diffuse across a number of agencies and partnerships with nontraditional agencies need to be cultivated.

37. Other parts of the federal government sponsor research directly applicable to the food and agriculture system. The National Science and Technology Council is intended to address the coordination of related activities across agencies. How is this intended to work in the case of research and extension on food and agriculture? How well is it actually working? Are alternative methods needed?

The National Science and Technology Council (NSTC) has not done a good job of marketing themselves. Their relationships with USDA need to be strengthened, particularly with the land grant universities and the SAESs.

National Research Initiative

38. Congress authorized the National Research Initiative (NRI) Competitive Grants Program at $500 million per year. If the NRI is to be fully funded, where in the USDA research budget could money be transferred from?

Inadequate funds are available in the USDA research budget to fully fund the NRI. State- or region-specific (noncompetitive) grants in the CSREES budget appropriated for facilities and programs could be redirected to the NRI. This redirection should generate more than $100 million for the NRI. Some of the unneeded ARS laboratories could be closed and unproductive or duplicative programs eliminated to generate additional funds for the NRI. ARS scientists are eligible to compete for NRI funds and thus would not lose access to the funds. Other sources of support within the existing research budget that could be transferred to the NRI include those special grants that are dedicated to a specific legislator's area or state initiative and are not a high regional or national priority.

SAES directors would probably agree unanimously that only formula funds are more important than the NRI.

39. What other options for funding the NRI should congress consider?

Congress should consider redirecting some funds from the discretionary portion of the USDA budget that will become available as programs are scaled back. For example, a portion of the funds made available as commodity programs are reduced could be redirected to the Agricultural Competitiveness Initiative (ACI). The development of new technology through research is one means of insuring that producers remain competitive and profitable in the global economy. If commodity programs are scaled back, there should be increased investments in agricultural research to insure that our producers are properly prepared to satisfactorily compete in the global marketplace.

The target funding for both the ACI and NRI is relatively modest in relation to many of the entitlement and other programs in the USDA. Agricultural research has been the major contributor to the stable, safe, inexpensive food supply available to this country and other areas of the world. Continued investment in formula funds, special grants and the NRI through control of spending in other program areas and diversion of some of these savings to the ACI is justified.

40. Have NRI appropriations been used to expand agricultural research or have they been used to continue existing programs?

NRI funding has been used for both purposes. Some of the programs that were in the USDA-CSRS Competitive Grants Programs were continued. These programs include fundamental studies of photosynthesis, nitrogen fixation, and animal reproductive physiology. Many new programs have been established as the NRI expanded. New programs include soil biology, agricultural systems research, human nutrition/food safety, utilization of agricultural products, and rural sociology/agricultural economics. These programs have given scientists the opportunity to conduct research in areas where funding was unavailable. However, it is important to realize that only about two-thirds of NRI funds go to land grant universities.

Agricultural Research Service (ARS) Laboratories

41. Should the USDA have research laboratories or should it provide competitive funding to existing entities such as universities?

It is essential that USDA-ARS have major laboratories that address national issues and programs that are beyond the scope of an individual state agricultural experiment station. Examples of these needed laboratories include the U.S. Meat Animal Research Center, National Animal Disease Laboratory, Roman L. Hruska Dairy Forage Center, National Soil Erosion Laboratory, regional Plant Introduction Stations, National Seed Storage Laboratories, and regional utilization laboratories. ARS currently has many small laboratories in remote areas that duplicate state agricultural experiment station programs. Many of these facilities should be closed or consolidated to improve efficiency in the use of resources and provide a critical mass of scientists at each resulting laboratory. Ideally, ARS and state agricultural experiment stations should have well coordinated programs that serve the needs of ecogeographic regions throughout the U.S. ARS can assist state programs through development of cooperative agreements for funding mutually beneficial research.

42. Should more ARS laboratories be co-located at land grant universities? What should be the relationship between ARS and land grant university scientists? Between ARS research coordination? How can ARS laboratory functions be more effectively linked to State Agricultural Experiment Stations?

It would be highly beneficial for ARS laboratories and individual research units to be co-located at land grant universities. The costs to ARS are greatly reduced by co-location because of the infrastructure provided by the universities. ARS scientists have adjunct faculty status and access to graduate students, library, facilities, seminars, and colleagues for interaction. Universities also benefit from the presence of ARS scientists on their campuses because of the increase in the expertise base and in total program scope. ARS scientists normally have excellent working relationships with university scientists when located on a campus.

Although there are good linkages between ARS and land grant universities at present, additional emphasis on joint strategic and program planning would be desirable. There should be a clear delineation of ARS and CSREES-SAES responsibilities at the national level and joint strategic planning to address research needs. Increased dialogue between the ARS area administrators and SAES directors would be helpful in program planning. Both groups of administrators need a better understanding of future plans of the other group so that programs are complementary, rather than duplicative and competitive.

43. Are ARS laboratory facilities effectively used in performing needed research? If not, please explain and offer suggestions for better use?

Many ARS laboratories are small and located in remote areas. There is a need to eliminate some laboratories and consolidate others to obtain increased efficiency and develop a critical mass of scientists. Laboratories are difficult to close because of parochial interests of local citizens and political leaders. A method should be developed to close unneeded and inefficient laboratories so that the resources could be used to address critical issues. Relocation of the programs and scientists to land grant university campuses would greatly reduce overhead costs and increase the productivity of ARS scientists. Major ARS laboratories should be maintained and enhanced to better carryout their national scope missions.

Extension Service (Extension functions within CSREES)

44. The USDA Extension Service's (ES) mission is, among other things, to disseminate research results to farmers and other customers. In your opinion, is the ES effective in carrying out this mission? (please explain).

Yes, the Extension Service (ES) is successful, but the level of accomplishment differs greatly between states.

Generally, the ES has and continues to serve farmers and agri-businesses very well. The broadening of the land grant university mission to include focus on urban as well as rural communities has also broadened the ES mission beyond agriculture. The success of the ES in dealing with farmers bodes well for its new opportunities in the urban arena. New support mechanisms must be developed to continue/maintain existing inputs while resourcing the new opportunities. Also, ES must assure that it develops its outreach programs based on solid research inputs.

45. Should the ES be involved in addressing the problems and challenges confronting urban populations?

State extension services are organized and supported to provide services to all counties in all states, regardless of their classification--rural, urban or suburban. Certainly those problems associated with agriculture and natural resources should be addressed regardless of classification or location. Extension has established a wide range of credibility for delivering a variety of information and service to a broad audience. The focus of ES activity should be driven by its funding bases.

46. What if any role should ES play in dealing with the social issues facing farmers and rural communities?

It is well within the ES mission to deal directly with social issues that are of high priority to farmers and rural communities. The SAESs conduct considerable research in the social sciences and transfer of research-based information to solution of critical social issues is appropriate.

47. Should the ES's mission statement be changed to focus activities on production agriculture?

Extension's mission must be broader than production agriculture. It should include other areas such as environment, natural resources, and socially related issues that are connected to agriculture. Extension is ideally configured to address a broad range of issues, although production agriculture should continue to be a major programming commitment.

48. What should ES not be involved in?

ES should set its agenda to include the above topical areas (agriculture, natural resources, environmental and related social issues) and stick with them. It is easier to identify a positive set of directions than to identify issues that are out-of-bounds without having some measure or description of the latter and a discussion of policy.

Dissemination of Research Results

49. Do you have any suggestions on how USDA's dissemination of federal agricultural research results can be improved?

Dissemination of federal agricultural research results should be the responsibility of the USDA and should receive inputs from all of its funded units. The ES should play a major role in the dissemination as they are well-equipped to move information into and out of county and district offices as well as to all congressional offices. The USDA should capitalize on the latest communication technology to make information available to the user community in a timely fashion.

50. Who is, or will be, responsible for developing a marketing plan for agriculture and its science and education programs to the American people?

The USDA should take the leadership and along with CSREES-ARS share the responsibility for developing a "marketing plan" for informing the American people about the contributions and continuing benefits from agriculture and its science and education programs. This is a major need if we are to continue to receive the funding needed to carry out programs, and, if the public is to receive the benefits of that research. Every scientist has an educational, as well as a research, role and should take part in delivering the results of his/her research to the constituency. USDA should take the leadership at the national level, with states carrying out a vigorous program at the state (and possibly regional) level to tell our story of success. The MIS programs discussed earlier will be necessary to delineate and define research accomplishments.

Current Research Information System (CRIS)

51. ARS uses CRIS to provide information about USDA research projects. How, if at all, do you use CRIS?

All faculty with any portion of a research appointment are required to list their research projects in the CRIS system. Standard information and fund reporting is made to CRIS. It is useful for new faculty and scientists to learn who else is working on similar endeavors. Within the North Central Region, we use the CRIS to identify and analyze our research investments and portfolio. It is useful for measuring inputs, eliminating duplicative investments and gaps, and identifying regional opportunities for partnering. Unfortunately, the system is out-of-date and lacks precision.

52. In your opinion, is CRIS effective in helping you obtain information on federal agricultural research projects? If not, what changes are needed to this information system that would provide quality data on federal and state agricultural research? (please explain)

Administrators frequently use CRIS to measure inputs and outputs within a specific Research Program Area (RPA) or some other data cell. However, CRIS is out-of-touch with the real world in terms of modern database management and the CRIS should be redesigned to better serve today's needs. CRIS information is acceptable for our own state because we know what we have put in to the system and what to expect from it. But, because states do their accounting and data collecting in different manners the use of CRIS to gather U.S. data is not recommended.

The CRIS was developed as a management information system and is good for that purpose as long as the data cell adequately defines your interests, i.e., if you want information on potato research at your station you can get reliable information, the same for production agriculture. However, if you want information about biological control mechanisms for bacterial pests you are not as likely to find it.

CRIS is useful for fiscal accountability, but it is not a fiscal accounting system. With today's information capabilities, there is really no excuse for not being able to use a table, graph, or scientific notation on a progress/termination report. Annual progress reports (AD-421), in lieu of the current summary, could allow publication titles along with abstracts/summaries which include those keywords from the AD-416 that apply to the particular article. If entries made as manuscripts are accepted, the information would be more current for scientists.

53. Is there/should there be an appropriate and adequate management information system(s) in place to report and collate results from federal investments in research, extension, and higher education sponsored by the USDA (and related research agencies)?

Absolutely, there should be such a system. Also, the results of research should be collected, collated and periodically published in the proper vernacular for the specific audience. The ARS "Agricultural Research" publication is a good model. Adding extension to the database and emphasizing the impacts and outcomes of AES and ES programs would be very positive.

54. Does the CRIS system and other USDA reporting systems provide an adequate accounting of the research and extension work that is being done in America?

See question 52. The research data are as accurate as the information that is put into the system. I am uncertain about how ES reports, but they do not use the CRIS.

International Relations

55. How can the USDA be most effective in the short- and long-term through its support of international activities?

USDA, as a federal agency, is ideally situated to work with USAID, the State Department and other agencies in international research, education and extension activities. Close coordination and involvement of the states in specific programs is essential to provide the expertise of individual scientists/educators. This can be done through contracts with individuals or consortiums of states or with individual faculty or staff members.

56. Currently, USAID and other programs extend agriculture and agricultural development beyond the nation's borders. What continued or expanded role should USDA play in international research, education, and extension?

The USDA should take the lead in continuing/expanding these international roles as long as support is available. The U.S. is the leader in agriculture, food and related sciences and we can and should do much to improve the capabilities of other countries. However, without additional resources we can ill afford to either continue or expand our activities.

57. What is the role of USAID in funding agricultural research and extension? Has USAID maintained support for agriculture or has the agency moved away from agriculturally related programs? What is the role of long-term agriculture R&D in developing countries in developing new markets for U.S. products? Should USAID contract through USDA-REE for long-term agriculture R&D?

USAID has, in part, moved away from funding for agriculturally related programs; part of this is related to decreased funding availability and also to mandates to address other issues. In the future USAID programs should take advantage of USDA-REE for long-term agricultural R&D; similarly, individual state land grant universities, and their component teaching, research and extension programs should be major players, either through direct contracts with USAID or with USDA.

AID's role in funding agricultural research and extension has never been very great (this is especially true of extension). In recent years even this limited role has been curtailed in favor of more popular topics, especially privatization and increased availability of primary and secondary schooling. Here, too little interest has been shown in agricultural education, especially at the college level. The kind of institution-building projects from previous decades have virtually disappeared in favor of short-term efforts at a much lower educational level.

The role of R&D in developing countries is much larger than simply creating new markets for U.S. agricultural exports. These countries do, after all, have large and growing populations to feed and they urgently need the help of R&D to increase outputs of food crops on lands that are being increasingly overused, underfertilized, and not allowed lengthy enough fallow periods to restore fertility. Women play an enormous role here-the UN estimates that they do 60-80% of ALL the work concerned with food production in Africa, and there is increasing evidence from Asia-especially from India-that the size of the role they play there is similar. YET Women are systematically discriminated against in such crucial areas as access to land and water, to education and to extension training. Given half a chance, a combination of R&D and delivering the information acquired to the real farmers would go a long way to solving the food deficits in much of Africa, and in the long run to increasing markets for U.S. exports, especially highly value-added exports like dairy products.

Under the present circumstances with AID facing increasingly high-powered attacks from congress in this very area and with a concomitant reduction in staff capable of doing this kind of work, subcontracting with the USDA-REE may be a useful short-term solution. USDA is likely to stress markets for U.S. exports and in my judgment that is not the most useful role for long-term R&D in agriculture in developing countries.

Northeastern Regional
Association of State
Agricultural Experiment
Station Directors

October 27, 1995

The Honorable Pat Roberts, Chairman
The Honorable Wayne Allard
The Honorable E (Kika) de la Garza
The Honorable Tim Johnson
The United States House of Representatives
Committee on Agriculture
Room 1301, Longworth House Office Building
Washington, D.C. 20515-6001

State Agricultural
Experiment
Stations of

Connecticut

Delaware

District of
Columbia

Maine

Maryland

Massachusetts

New Hampshire

New Jersey

New York

Pennsylvania

Rhode Island

Vermont

West Virginia

Gentlemen:

Thank you very much for the opportunity to respond to the 57 questions from the Committee on Agriculture of the U. S. House of Representatives, regarding the Research Title of the Farm Bill. The exercise was very stimulating and rewarding for ourselves and, we believe, important for those whom we serve.

The process used by the Northeastern Region to develop our responses was multi-staged. We first circulated the questions to all of the Region's State Agricultural Experiment Station directors to gather input for a first-round drafting exercise. This was then followed by a review of the proposed responses by representative research directors and members of associated functions (e.g., teaching, extension). At the same time we sought the advise of appropriate federal agencies (e.g., ARS, ERS, CSREES), and related areas of science. I believe that our process has permitted us to represent to your study broad areas of need, opportunity, and interest.

Once again, thank you for the opportunity to participate. If we can be of further assistance, please do not hesitate to call on us.

Sincerely,

David R MacKenzie

David R. MacKenzie,
Executive Director

BEST COPY AVAILABLE

RESPONSES

from the

Northeastern Regional Association
of
State Agricultural Experiment Station Directors

for the

Agricultural Research, Education and Extension Questions from the U.S. House of Representatives' Committee on Agriculture

October 1995

PREAMBLE

The northeastern agricultural region of the United States is comprised of twelve states and the District of Columbia, and contains fifteen State Agricultural Experiment Stations devoted to agricultural research. In addition, the northeastern region has considerable activities in agricultural teaching and extension. These three functions (research, teaching and extension) for agriculture are primarily located at Land Grant Universities, and the programs operate as part of the federal-state partnership in agricultural sciences.

The following responses to the 57 questions posed by the U.S. House of Representatives' Committee on Agriculture were derived through consensus building, following input-gathering from Directors at all fifteen State Agricultural Experiment Stations. This was followed by reviews by six Directors of a draft paper. In addition there were formal discussions of the draft responses with representatives of teaching and extension activities from within the region. Also, the draft responses were reviewed by a regional advisory committee (the Northeast Regional Council) with representation from: teaching, research and extension programs at universities; production agriculture; public interest groups; the agricultural service industries; USDA agencies (e.g., ARS, ERS, CSREES); and the National Association of State Universities and Land-Grant Colleges.

The timing of this series of questions is particularly appropriate to the northeastern region, as the administrative leaders (academic heads, directors of research, directors of extension, and academic program deans) are now exploring opportunities to develop new processes for collaboration. The respondents found the questions stimulating and very worthwhile for exploring the array of options that are available for strengthening programs and providing evermore improved services to our "customers". On behalf of the public institutions that provide these services, we express our appreciation for the opportunity to participate in this exercise antecedent to the 1995 Farm Bill.

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Agricultural Research, Education, and Extension Questions for Discussion

Federal Agricultural Research Goals

1. **What should be the role of the Federal Government in agricultural research?**

The federal-state partnership in agricultural research is considered a hallmark of the U.S. public sector research enterprise that has contributed so much to the bountiful production of U.S. agriculture. The U.S. federal-state partnership is credited world-wide with being a uniquely productive research system that has, for the past 100 years, amply met the nation's need for improved agricultural systems.

There is emerging a new consensus on the definition of contemporary agriculture. Today, agriculture extends beyond production, to include food and nutrition, human and community development, and environment and natural resource management. This expanded vision of what constitutes modern agriculture must be reflected in the agricultural research agenda, if the public institutions providing new knowledge are to be seen as relevant and responsive to public expectations. The System has a special obligation to take an interest in those priority research topics that have little or no appeal to the private sector, but must be done if societal needs and expectations are to be met.

Public expectations differ by regional and state needs, which are often determined by geography, population density, tradition, and a host of other factors that help set the priorities of that area. For this reason, the national effort in agricultural research is organized accordingly, with regional and state planning coordinated with national planning for the federal-state partnership in agricultural research.

The federal-state partnership recognizes the division that must be maintained between the public sector's obligation to meet public need and the private sector's legitimate business opportunities. Coordinating these complementary research activities necessitates federal government involvement in decision making, and through the federal-state partnership, state and local needs are met, along with national goals.

The role of the federal government should continue to be a strong partner in the public sector's involvement in creating and providing new knowledge for tomorrow's agriculture.

2. **To what extent should goal setting and goals in agricultural research be cognizant of and coordinated with research activities in the rest of the Federal research sector (HHS, EPA, DOE, etc.)?**

There is clearly a need to coordinate agricultural research activities across the federal research sector, especially in the area of goal setting, and for the assignment of responsibilities to assure appropriate funding for priority programs and the avoidance of duplication. There are many mechanisms within the federal research sector that assures that this is done. Formal mechanisms include inter-agency working groups (some formed under the Office of Science and Technology Policy) and others through inter-agency working groups for particular topics. Informal coordination occurs to a considerable degree by working groups of scientists interested in common topics and/or problems.

One impediment to the formal and informal systems of goal setting and agricultural research coordination is the Federal Advisory Committee Act, which gets in the way of non-federal scientists' participation in planning for the federal-state partnership, and who must operate at arms-length from federal agencies, or with encumbrances that slow the process of discussion and deliberation of proposed research activities. The impediments of FACA are noted in responses to some subsequent questions.

3. **Is the process associated with the Food Animal Integrated Research for 1995 (FAIR '95) adequate for the development of Federal agriculture research goals? Are there goal identification processes which might better serve to enhance Federal agricultural research other than FAIR '95?**

The process of FAIR '95 is judged to be valuable, but mostly for animal agricultural research. Although the agenda of FAIR '95 could for the most part be accommodated by the plant and soil sciences, and to some extent by the food and social sciences, they do not cover the extent of all agricultural priorities for research.

The Plant and Soil Science Forum, established in August 1993, paralleled the activities of FAIR '95. A number of priority items were identified through the Plant and Soil Science Forum, and these items are available from the American Society of Agronomy (a contact point is Dr. Robert F. Barnes, Executive Vice President of the Society, at 608-273-8080) which spearheaded the Forum's activity for a number of professional societies. For the food sciences and technologies, similar information is available from Dr. Joyce Nettleton at the Institute of Food Technology at 312-782-8424 from a project entitled U.S. FEAST.

4. **If the process of FAIR '95 were to be used to adopt an agenda for Federal agricultural research, how would the goals identified in FAIR '95 and listed below, need to be modified to address the concerns of all research stakeholders?**

   1) Enhance industry wide responsiveness to consumer and societal concerns;
   2) Meet market demands through increased efficiency and competitiveness;
   3) Develop integrated food animal management systems;
   4) Maintain and enhance environmental quality;

5) Improve food quality control in terms of safety, desirability, and nutritional composition; and
6) Enhance animal well-being through the life cycle of food-producing animals.

The goals identified in FAIR'95 need to be expanded beyond a market perspective for a more rounded treatment of what needs to be done to meet societal goals (e.g. consumer acceptance, safety, environmental protection). Point three would need to be expanded beyond food animal management systems to crop and forest management systems, as would item 6.

Priority Setting

5. **Is Federally funded agricultural research focused on the issues of highest priority for producers, processors, and consumers? If not, how can the priority setting mechanism be improved to insure that these issues are addressed?**

The federal-state partnership has had, for the past ten years, an excellent process of setting priorities for the national agricultural research agenda. This partnership is operated through the Experiment Station Committee on Policy, and the Cooperative State Research Service of the USDA,(recently combined with the Extension Service to form the Cooperative State Research, Extension, and Education Service (CSREES)).

There is, however, broad recognition that the current process needs to be modified to accommodate the Government Performance and Results Act, and to focus the selection of priorities to better match anticipated resources for agricultural research. There is a need to provide mechanisms for more rapid responses to newly identified agricultural problems. There is also strong interest in designing a new priority setting system that would be more responsive to changing societal needs, and that would recognize regional differences and opportunities for agricultural research.

It is not clear how an improved process for priority setting will be created. It is clear that whatever new process should emerge, it must be supportive of the federal-state partnership, which requires consensus building by all participants, rather than a top-down prescriptive mechanism for setting an agricultural research agenda.

6. **Should Federally funded agricultural research address specific technological and industrial needs? If yes, does the present system fulfill this goal (if not, please describe how this can best be accomplished)?**

A qualified yes seems appropriate to the opportunities to federally fund agricultural research specific for technological and industrial needs. The qualification is the need for an understood separation between the public and private sectors as the missions of the two sectors are quite different, but opportunities exist for complementarity. In several ways the SBRI meets this need.

There have been some interesting model systems developed to link the public and private sectors together in areas of common interest. The Midwest Plant Biotechnology Consortium matched federal Special Research Grant funding at participating institutions to private sector grants in plant biotechnology. This type of mechanism could be very useful for bringing the public and private sectors together to leverage funding on a regional basis for the best quality science of relevance to industry. The interest for providing such linkages is in accelerating the competitiveness of certain types of technology to gain an advantage for the United States in world markets. The present system does not do this well, and new mechanisms probably ought to be developed as new federal authorities for research partnerships.

7. **Does Federal agricultural research adequately address projects that result in quantum leaps in benefits, or does it dwell too much on incremental benefits?**

The outcome of agricultural research is not predictable in either the medium or the long term. Considerable scholarly study has been given to understanding how quantum leaps occur in research, and what might be done to facilitate breakthroughs. These studies have shown that research breakthroughs require a technological pool of information developed through past investments in research that are available for champions (i.e. extraordinarily committed scientific leaders) supported with adequate resources on a continuing basis to bring about a breakthrough. Many of the mechanisms in place today do not support the elements necessary for breakthrough research. The problem is not so much a dwelling on incremental benefits (although some maintenance research is absolutely necessary to maintain past gains in productivity). The problem seems to be in providing the sustained support for program champions. New institutional mechanisms may be necessary to facilitate quantum leaps. Perhaps this is the time to experiment with alternative sources of funding that would support quantum leap programs in designated areas. The 1995 Farm Bill could provide this authority on an experimental basis.

8. **What is the appropriate role for USDA/REE in insuring competitiveness in the face of decreases in price support programs?**

There has been considerable discussion of the opportunity for new technologies that would better insure U.S. agricultural competitiveness. It has been proposed that the federal government provide leadership through the Agricultural Competitive Initiative (ACI) as an applied practical research and extension competitive grants program, as a countermeasure to decreases in commodity price support programs. The ACI is clearly not a substitute for price support programs, but rather it would provide new technologies that would allow producers to become self-sufficient in global market competition. The agricultural research community sees the ACI as visionary, and entirely appropriate for the changing needs and priorities of the United States.

9. **How can the appropriate Federal-State-Industry resource pools be integrated to develop high priority regional programs in research, teaching, and extension?**

The Northeast Region has initiated a major effort to better coordinate teaching, research and extension among institutions within the Region. A year long initiative was launched in July 1995 to invent new processes to facilitate collaborative efforts under the guidance of institutional and agricultural production leaders. This initiative recognizes the changing demands on regional institutions, and the need to draw upon the fundamental strengths and underlying tenets of the Land Grant University System, which brings together teaching, research and extension through integrated activities and institutional partnerships.

It is anticipated that the redesigned processes will build strategic partnerships within the public and private sectors, among institutions, and across functions to greatly enhance productivity and program efficiency. The participating institutions, based on recognized opportunity and resources constraints (relative to need) are propelling the activity forward. Self-interest is probably the best motivation for bringing about change, and is clearly preferred to a prescriptive solution to the region's needs.

10. **How important is the Federal agricultural research role in supporting other agencies of USDA? Of other Federal agencies? Could this be done more efficiently and at lower cost?**

Federal agencies have primarily responsibilities for research or regulation. Federal regulatory agencies have a need for agricultural research to provide necessary information for science-based decision making. To a great extent, the agricultural research needed by the federal government to support regulatory decision making has been accomplished intramurally (e.g. Agricultural Research Service), but this may not be the most efficient way to obtain scientific knowledge. Some proponents of change have suggested that regulatory agencies should broadly solicit proposals for research activity needs, both from research agencies as well as from public institutions through a more open and competitive process of research grants. Done correctly, this should be more efficient and cost-effective for the research conducted.

11. **USDA reorganization created the Cooperative State Research, Extension, and Education Service (sic) (CSREES). In your opinion, how should this newly configured agency function to support the U.S. agricultural enterprise, 1995-2002?**

CSREES clearly has a mandate to bring together the functions of extension, research, and higher education from the federal perspective. This mandate provides a new and exciting opportunity for the Agency to facilitate integration of functions within the federal-state partnership in agricultural science. The new mandate is consistent with one of the fundamental tenets of the Land Grant Universities, which is integration of teaching, research and extension. Pursuit of the Agency's mandate should work to strengthen the federal-state partnership, and provide the Land Grant University System with an approach previously not possible.

There is concern within the federal-state partnership that the internal structure of the new Agency is not suitable for the Agency's mandate. The reorganization of the Agency provides six divisions that do not clearly align with an agenda consistent with the perceived needs of the U.S. agricultural enterprise 1995-2002. Much of the reorganization reflects scientific discipline differences and the continuation of programs inherited by the former agencies that were combined to make up CSREES. A revised internal structure of the Agency might better support the Agency's mission under its new mandate.

12. **What is the proper place for integrated systems programs? What role should the Extension Service (extension functions within CSREES) play in these programs?**

The term integrated systems programs was taken in this case to be cross-functional (e.g. extension with research; research with teaching, etc.) programs in agricultural science.

There is clearly a merging of consensus within the federal-state partnership that more needs to be done to integrate functional activities within programs. A great strength of the U.S. agricultural research system is the information feedback mechanism provided by the Extension Service that assists in selecting research priorities for developing appropriate technology for U.S. agriculture. Questions are now being raised as to how this mechanism can be further strengthened for mutual benefit within the system. Similar opportunities exist for other cross-functional program operations and planning. It is envisioned that future activities within the federal-state partnership will be greatly strengthened through integrated systems facilitated through new processes currently under development.

Advisory Boards

13. **Have USDA's research and extension advisory and coordinating boards been effective in planning and prioritizing agricultural research and extension? (Please explain)**

The USDA's research and extension advisory and coordinating boards have been effective in broad areas of planning and prioritizing agricultural research and extension. The present advisory system supports the federal-state partnership, and provides important vision and endorsement of national directions and societal needs.

Those who have criticized the advisory and coordinating boards of the USDA often fail to appreciate how the federal-state partnership operates. The U.S. system is not a prescriptive, centrally planned top-down mechanism, but a consortium of partners who agree to work together to leverage multiple sources of funding for a common good and for greater responsiveness to local, state, regional and national needs. Critics who argue that the federal investments in agricultural research and extension directly obligate institutional activities do not understand the federal-state partnership, or the benefits that are derived through the institutional pluralism and flexibility that permits the pursuit of intellectual creativity and scientific opportunity.

The USDA's national level advisory and coordinating boards have helped set a conceptual framework within which the participating institutions can align research and extension projects, and identify opportunities for collaboration with other partners. These activities have been effective and well received.

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There is strong interest in the Northeastern Region for providing a mechanism for regional input into USDA. In the past such mechanisms have proven valuable, but in recent times the process has fallen into disuse. The research, teaching, and extension needs of the agricultural regions of the U.S. are distinctly different in a number of areas, and this needs to be accommodated through appropriate advisory mechanisms. Provisions should be included in the 1995 Farm Bill for regional advisory committees, to assist the national-level system of advisors.

14. **How have research or extension priorities been changed as a result of the recommendations of advisory boards (please provide examples)? Are there presently too many advisory boards?**

The USDA advisory boards have identified priority areas for national emphasis. These topics have been taken up by the partner institutions. Some examples of these national initiatives include: research in biotechnology; water quality; technology impact assessment; rural development; youth at risk; and sustainable agriculture. Without the national vision provided through the advisory boards of the USDA, it is unlikely that the justifications, rationale or legitimacy of these initiatives or others would have so quickly emerged.

Regarding the number of advisory boards of the USDA, we share the following concerns. Reductions in their number would decrease the number of voices represented through the process, and would thus diminish the democratic nature of the Department's advisory system. This could, however, be circumvented if the Federal Advisory Committee Act were modified to allow broader participation by the federal-state partnership through more informal mechanisms and through more *ad hoc* participation in dialogue and discussions.

15. **What options should Congress consider to improve USDA/s process for planning and prioritizing agricultural research? (i.e. how should the research agenda be prioritized?)**

Prioritization of the agricultural research agenda should be built through mechanisms that identify the best possible science to do research relevant to our "customer" needs. The mechanism should recognize regional differences, and should encourage institutional "buy in" to ensure involvement in addressing the issues contained in the research agenda.

The current process is probably less efficient than it needs to be, to meet these objectives. Revisions to the USDA's process should include more effective perspective-gathering, greater use of merit review, and second stage relevance evaluation of proposed research .

16. **What role should stakeholder advisory boards play in setting the agenda? What groupings should be represented on advisory boards? Can "customers" and "partners" be accommodated on one board or will it require two?**

The "customer" perspective is important for establishing relevance for proposed agricultural research. Obtaining national perspectives from both "customers" and "partners" may require groupings too large to manage efficiently. There are, however, some options, which include agenda setting by natural divisions of agricultural research (e.g. animal systems; plant systems), or through the use of regional advisory boards that would feed into a national system. There is no clear advantage to separating "customers" from "partners", and in fact, there may be advantages to co-mingling them on one board.

17. **Is there a special role for advisory boards to play in international agriculture beyond what has occurred in the past?**

International agriculture is often misidentified as only third-world technical assistance programs. This aspect of agricultural research, although important, fails to recognize the opportunities for true international agricultural research partnerships with other science-strong nations in Europe, North America, and Asia.

Opportunities to collaborate on pre-commercial research in agriculture and to form joint ventures in research-enabling activities (e.g., plant and animal genome mapping) have met with difficulty, as existing authorities and administrative mechanisms are inadequate to support these interests. The 1995 Farm Bill could provide new authorities for "International Agricultural Research" that could be of enormous benefit to the United States through international strategic partnerships. A model that could be explored would be the regional research mechanism of the Hatch Act, extended to include international collaborations. The areas that would most benefit from "internationalization" would be the joint planning of research, the delineation of responsibilities for research topics, the sharing of data, and cooperation on science policy in areas such as harmonizing regulations.

Funding Considerations

18. **What is the most appropriate mix of Federally funded basic and applied agricultural research?**

The definition of basic and applied research usually involves a description of a continuum of activities not easily categorized, and certainly open to considerable argument. Basic and applied agricultural research is additionally complicated by the fact that agriculture often draws on basic, general biology research for problem solving. This point is easily illustrated by the current agricultural research efforts to map animal and plant genomes. Much of this work is interdependent with efforts going on in many other areas of science, nationally and internationally.

Regardless of the definition of basic and applied research, agriculture needs some of both to assure that present and future needs of the national agricultural system can be met. The appropriate mix for the federal government is necessarily in a constant state of flux as scientific opportunities emerge, investments by the private sector change with time, and public expectations shift among topics or emerging problems. Under-investments in either basic or applied agricultural research can be problematic. The targets shift with time, and thus research managers need some flexibility at the decision making level.

19. **How, if at all, can the effectiveness and efficiency of agricultural research be enhanced at current funding levels? At reduced funding levels?**

There is considerable concern by contemporary agricultural research managers for maintaining a balance between effectiveness and efficiency of agricultural research . The effectiveness of agricultural research is provided through merit review of proposals competitively awarded to the best science of relevance to national needs and goals. There are, however, transactional costs in conducting a competitive program, inasmuch as commonly four out of five proposals do not receive funding. The transactional costs (i.e., time to fill out applications; peer review proposals) of a competitive program drain the system of resources and contribute to inefficiencies in both the grant application process and the grant review process.

A recent study by Huffman and Just (American Journal of Agricultural Economics, Nov. 1994) analyzed the types of funding mechanisms used in the United States to support agricultural research. The authors concluded that the transactional costs of competitive programs is clearly evident when measured as increased agricultural production. Formula funding was said by the authors to provide greater efficiency, as there are minimal transactional costs. The United States has long used formula funding mechanisms (such as the Hatch Act) to support the federal-state partnership in agricultural research at State Agricultural Experiment Stations. A significant boost to the federal-state partnership comes from the state matching fund requirement that highly leverages (i.e., multiplies) the resources made available to agricultural researchers in the Land Grant System.

If the intention of investing in agricultural research is to increase productivity, some choices are clear. Formula funding has been more efficient and effective. If the intent of investing in agricultural research is, however, to provide a knowledge pool for future problem solving, other mechanisms may be more appropriate. But, with a success rate of one in five grant proposals, the transactional cost inefficiencies of the competitive grant award system may be too great to justify the benefits of merit review by peer panels, at current levels of funding. There needs to be a thorough rethinking of the appropriate mix of funding mechanisms to meet national goals and societal needs.

20. **How can future funding be determined and justified so as to permit multi-year programs to be completed?**

As noted in previous responses, new funding mechanisms for agricultural research are needed to support multi-year programs, especially for those sectors of U.S. agriculture that must maintain (or regain) competitiveness. Ideally, there should be a mix of mechanisms to support agricultural research for different types of expected outcomes. More impact analysis is needed (such as the Huffman and Just study) to help design a better array of funding mechanisms to meet expectations for agricultural research.

There is, however, an important aspect of formula funding that is often forgotten by those unfamiliar with the System. Formula funding allows State Agricultural Experiment Stations to provide continuity in research planning. This has allowed the Stations to be much more responsive to emerging needs, precisely because they could anticipate future appropriations (in a relative sense). Station Directors are able to place resources where they can do the most good. Formula funding for agricultural research has worked very well, and this success needs to be considered when looking for ways to reinvent scientific research funding mechanisms.

21. **In view of the growing emphasis on greater accountability of Federal expenditures, do you have any suggestions as to how agricultural research results can be measured and their impact evaluated? Is there some standard of accountability for the efficient and effective use of Federal research funds?**

Considerable scholarly research has been devoted to judging the impact of science research investments. The National Science Foundation in the mid 1980s and an earlier study by Batelle Laboratory, in Columbus, Ohio, have set out the standards for investigating technological accomplishments in areas of science, including agriculture. We have learned from these studies that the analysis requires considerable amounts of information not normally collected by management accounting or results reporting in scholarly journals. There is a need today for a new tracking system for agricultural research investments that would go beyond the documentation of expenditures and description of activities: to capture measures of outcomes and consequences to be used for analytical purposes, for understanding the benefits of research investments; and for accounting for public tax dollars provided for research projects. Investments will be needed (perhaps as set-aside funds) to support impact assessments of agricultural research outcomes, as an *ad hoc* approach will not be effective or comprehensive.

22. **What is the proper balance between in-house, formula funds, competitive grants, and special grants?**

There is clearly a need to maintain a mix of funding sources to provide a mixed portfolio of activities in agricultural research. The proper balance of different types of funding relates more to institutional strategy than to national priorities. The pluralism of the federal-state partnership/Land Grant University System is recognized as a great strength. This pluralism provides differences in institutional priorities that build upon existing strengths and rely on different types of funding to accomplish their goals. There is good argument for creating even more diverse mechanisms for funding agricultural research, and thus support pluralism through institutional choices.

As noted in earlier responses, the Huffman-Just study has shown that the outcomes from agricultural research are related to the types of funding source that supported that research. A greater understanding of these interrelationships will allow better planning of research with a national perspective. More research on how to do impact assessment is clearly indicated.

23. **What guidelines should be used in determining appropriations for "specified programs" in research, education, and extension?**

Agricultural research clearly has a need for specified research in topic areas to meet regional and national needs. The process for specifying research programs has, however, met with considerable criticism, when done as an "earmarking" of funds. This practice is said to be inconsistent with quality science provided through peer review and competitive awards of research grants. But this position represents a paradox for agricultural research managers who wish to provide more responsiveness with science quality. The solution would appear to be greater specificity in requests for proposals, or a separate authority for research contracts on specific topics.

The rapid emergence of regional and national problems such as the pathogenic strain of *E. coli*, the A2 fungicide resistant strain of the potato late blight pathogen; the sweet potato white fly and others clearly demonstrate the need for a rapid response that is not possible through existing mechanisms for funding agricultural research. The 1995 Farm Bill should give strong consideration to creating authorities for rapid, relevant responses through high quality science research to meet rapidly emerging agricultural needs. A model authority for a rapid research response mechanism was drafted by USDA for inclusion in the 1995 Farm Bill. Its status is not known at this time.

24. **Should Federal funds be used for programs only, or for facilities as well? If for facilities, how should they be allotted - competitive proposals or other? Is there a place for regionalizing research, increasing competitive grants, etc.?**

There is considerable justification for federal funding for facilities construction and renovation. Many institutions in the federal-state partnership have been unable to maintain adequate facilities for agricultural research, and thus their capacity for contributing to the national system has been diminished. The creation of a competitive facilities grants program could include provisions that would diminish criticism of "pork barreling" through competitions that would evaluate institutional for program uniqueness, relevance to national goals, and importance to regional needs. Approval could require either matching funding, or with suitable justification, in-kind contributions (e.g., institutional partnerships, shared faculty, provision of services for regional efforts, or joint agreements for program responsibilities), to leverage resources.

25. **Is there a place for partnerships not only with state and local public sector organizations and industry; but also with private foundations?**

Many institutions currently maintain strong partnerships with private foundations that support agricultural research. These strong partnerships could be further strengthened if the federal government was to offer matching-fund grants to leverage private industry, private foundation, and commodity funds for a multiplier effect.

26. **To what extent do self-assessed "check-off" fees on commodities provide resources for research and education? Do these/should these programs support long-term research, as opposed to short-term product development and promotion research?**

Marketing orders or "check off" funds to support commodity research vary by institution, but at some State Agricultural Experiment Stations, the amounts are significant and highly valued. The amounts vary by commodity, and they mostly support applied research, often with a long-term perspective, such as plant breeding and crop protection research.

The 1995 Farm Bill could provide new authorities for marketing orders, especially for export commodities. For example, there have been discussions recently for creating an international potato export marketing order for potato late blight research. Exporting countries such as the Netherlands, Canada and the United States would, by this proposal, contribute to a common fund that would support a grants program for research on this very important disease problem. The concept is modeled after a common fund marketing order for export dessert bananas managed by the World Bank. Providing authority for international commodity funds to the USDA could promote international collaboration in research with joint sponsorship by other nations, for mutual benefit.

Most "check-offs" do not support long term, basic research projects because the interests of the sponsoring commodity groups is usually derived from a short-time horizon that is focused on solving more immediate production problems. This is reasonable, and another justification for taxed-based research investments; to be sure that the longer-time-horizon research priorities (as well as priority 'non-production' problems, such as environmental protection, safety, etc.) are also addressed in the comprehensive research agenda.

Delivering Agricultural Research

27. **In order of priority, what would be the most significant actions USDA could take to improve its management and/or delivery of agricultural research?**

1) *Adopt a new paradigm*: The integration of teaching, research and extension needs to be done in ways to permit joint planning, pooling of funds, and reporting of activities through a common, multi-disciplinary, inter-institutional approach.

2) *Embrace the federal-state partnership*: By exempting CSREES from the Federal Advisory Committee Act, the Agency could become a more equal partner in the planning and coordination of research management and delivery.

3) *Better accountability*: Reengineering the national reporting systems for agricultural research and extension into one system would provide accountability for research and extension outcomes, consequences and impacts. In this way the USDA could significantly improve its management and/or delivery of agricultural research knowledge.

4) *Draw on the Partnership*: The Department should use the privileges of the Intergovernmental Personnel Act (IPA) to draw leaders from the partnership into the USDA for limited periods, much as is now done for the Chief Scientist position in the National Research Initiative Competitive Grants Program. The former Agencies that now make up the CSREES

had in the past used the authority to some extent, but there is much less use of IPA's today, for unexplained reasons.

28. **What options should Congress consider to improve the delivery, results, and benefits of Federally funded agricultural research?**

As noted previously, Congressional authority should be extended to the federal-state partnership to exempt specific planning and coordinating activities from the Federal Advisory Committee Act. The department's advisory committee system could be redesigned to provide broader input from research and extension "customers", and mechanisms should be created to reward productivity within the federal-state partnership, recognized as science quality, relevance and responsiveness to national needs and goals. There is considerable experience available to help plan such strategies and approaches. For example, in the Northeast Region, the Joint Session is working on plans to facilitate multi-institutional integration of teaching, extension, and research through new processes. This has been a valuable experience available for sharing with others.

29. **What should be the Federal role in insuring training of future work forces for the food and fiber needs as well as the natural resource concerns of the public?**

The federal role in insuring training of future work forces should be through the federal-state partnership at Land Grant Universities, at both the undergraduate and the graduate levels. The federal-state partnership provides presently, through research grants, considerable support for graduate education in the agricultural sciences and related fields. Modest funding in undergraduate education through USDA's Higher Education Program supports education in the food and fiber needs, as well as natural resource management. There is also modest funding for graduate fellowships through the Department's National Needs Fellowship Program. These are important sources of student support in the agricultural sciences.

Existing funding mechanisms may not be adequate for future needs, and this should be studied carefully for the consequences. For example, indirectly funding graduate education through research grants may not be sufficiently responsive to job market changes, as graduate assistantships are linked to current research opportunities, not future national needs. Decoupling graduate assistantships from research grants could provide a completely different pattern of graduate education, from a national perspective. That could be an improvement, depending on the factors and forces that determine student selection of graduate programs.

The larger concern is for sufficiently sustained resources to continue teaching the agricultural sciences in the Land Grant University curriculum. The diminished "political clout" of agriculture at the state level has placed many of these curricula in jeopardy on many campuses. This is especially true in the Northeast Region where the intensity of problems attendant to agriculture mandate more, not less, investments in an educated populace *vis-a-vis* agriculture. This contradiction needs a strong national voice, and concerted efforts are needed to correctly decide how the future will be addressed.

The Kellogg Foundation has provided needed leadership in this area by funding studies that look at educational needs across institutions, and within regions. Even with these investments more needs to be done. A thorough evaluation of the federal role in agricultural education within the partnership is indicated.

Land Grant Universities

30. What is the continuing role of Land Grant Universities? 1890's Colleges? 1994 Colleges?

These are undoubtedly challenging times that will require new activities and programs to meet changing needs. The role of the 1862 Land Grant Universities has changed significantly in the last decades as expectations continue to evolve to include more non-food and natural resource issues. There is, however, a strong belief that institutional structures and values will continue to well serve the public into the future. Land Grant Universities, 1890 Colleges, and the 1994 Colleges represent a valuable mix of institutional capacity, structural need, and diversity that should be preserved. These institutions have a demonstrated record of productivity, through a mix of functions of teaching, research and extension that will allow them to adapt to new challenges.

31. Is the current formula used for allocating Federal funds to land grant universities fair, reasonable, and does it address changing conditions? If not, how could it be improved?

There is general consensus within the Land Grant community that formula funding for agricultural research is generally fair, and alterations to the formula would not bring about significant change to the system. Indeed, it is generally held that restructuring the formula is not seen as an avenue for improvement.

The importance of the formula funds for agricultural research is in the leveraging of the state matching funds and the continuing support that allows agricultural research to take on a longer-term view of problem solving, with a regional and/or state focus.

32. The land grant universities have a system of agricultural experiment stations in each state. In today's environment of Federal and state fiscal constraints, is such an extensive system of research stations still warranted (please explain)? Could certain functions be merged with other USDA agencies, other Federal agencies, etc.?

A fundamental concept of the federal-state partnership in agricultural research is the utility in having a State Agricultural Experiment Station within each state to provide responsiveness to local, regional and national needs. Proponents of changing the system have argued that fewer stations could meet the national need, and that some stations are redundant or superfluous. Those who provide these counter-arguments fail to recognize the necessity of linking research to extension at the institutional level, and the requirement for verifying technologies at the production level at multiple sites. It may be true that some types of research can be done at one location and extended to many others, but agricultural research quite often confronts problems that need solutions adapted to individual production areas. The formation over 100 years ago of a dispersed State Agricultural Experiment Station System addressed this need, and the structure is relevant today. This is an important fundamental concept of the federal-state partnership that needs to be preserved.

One important by-product of the joining of teaching, extension and research within the Land Grant Universities is the "spill-over" effects that synergize the investments, and make the "whole greater than the sum of the parts". This amplification of resources is said to be a fundamental reason for the globally unchallenged superiority of the United States' Land Grant System in the agricultural sciences.

Given the constraints to the system, individual State Agricultural Experiment Stations are partnering with other Stations to gain greater efficiency and to have a greater impact through shared responsibilities, resources, and information. Regional Research is becoming ever more important for getting the job done, and institutions are jointly planning research programs, fostering institutional specialization, sharing results, and distributing credit for the successes they are having through new strategic partnerships.

Merging certain functions with other USDA agencies or other federal agencies does not seem feasible, inasmuch as they have different missions and do not have the site-specific research capacity of the individual State Agricultural Experiment Stations.

33. **How can agriculture research be best coordinated among Federal, State, and private institutions?**

There is presently extensive coordination among federal, state and private institutions for agricultural research. The federal-state partnership in agricultural research has, for the past 10 years, jointly planned an agricultural research agenda. This has been coordinated with advisory committees to the Department of Agriculture, and this has set the framework for regional and institutional planning nationwide. Involvement of private institutions, the private sector, commodity groups, and special interest groups takes place through the planning mechanisms that have become an integral part of the federal-state planning process.

Within the Northeast Region (as mentioned earlier) a process is being designed to facilitate inter-institutional collaboration in teaching, research and extension. We believe that this is indicative of the evolutionary process that is now being experienced to provide enhanced coordination among all players and interest groups.

34. **What models currently exist, and are in use to provide regional cooperation in research and extension?**

New models are emerging to provide enhanced coordination and cooperation between research and extension. Already, the Northeast Region has identified their cross-functional common values as they move towards inventing new processes and strategies for improved inter-institutional collaboration. The model that is being studied is the successful Regional Research authority, which has the potential for being extended to all functions of the federal-state partnership in teaching, research and extension.

35. **In the current era of constrained resources, is it appropriate to use Federal funds to promote cooperative regional research to reduce unnecessary duplication; and to what extent is it appropriate to use Federal funds to encourage consortia of states to establish individual centers of excellence to address common problems?**

It is entirely appropriate to use federal funds to promote cooperative regional research, and in fact, this is done through the Regional Research Funds authority under the amended Hatch Act. Regional Research coordination reduces unnecessary duplication, and encourages states to pool resources to build programs of excellence in agricultural research. In some instances, it makes sense to create consortia, and many successful examples could be cited. There are, however, careful considerations that must be evaluated to avoid unintended consequences of using consortia (e.g., they can take on a life of their own) instead of state partnerships.

36. **As societal concerns about natural resource use, rural development, animal well being, etc. are integrated into the USDA agenda, is there a role for "new" partnerships with the Federal sector?**

Already, new partnerships with special interest groups have formed within the USDA family to provide dialogue in areas of interest and concern. Conferences, workshops and meetings have dealt with a number of topics, ranging from biosafety to economic impact, to animal welfare, and have helped to set a research agenda that is responsive to public interests.

37. **Other parts of the Federal Government sponsor research directly applicable to the food and agriculture system. The National Science and Technology Council is intended to address the coordination of related activities across agencies. How is this intended to work in the case of research and extension on food and agriculture? How well is it actually working? Are alternative methods needed?**

The Department of Agriculture is a major player in the National Science and Technology Council's process for coordinating activities. As the representative for the federal-state partnership, the USDA helps plan strategies for participation in research directly applicable to the food and agriculture system. Examples of research coordination include joint planning with the U.S. Environmental Protection Agency in IPM research; joint planning of fundamental science with the National Science Foundation; coordination with the Department of Energy in plant science research; and many other projects.

It is not clear how well the system is working, as the changes have been recent, and the impact is yet to occur. One of the anticipated difficulties is the absence of linkage between NSTC priorities and funding for research. Another difficulty is that the USDA alone has had to represent the federal-state partnership in the federal government, because of the limitations of the Federal Advisory Committee Act. Direct participation by the non- federal partners would certainly help in the planning and coordination of activities across the agencies that have a common interest in the agricultural sciences. The federal-state partnership in agricultural science needs statutory exemption from FACA. The Farm Bill seems to be an appropriate authority to provide that exemption.

National Research Initiative

38. **Congress authorized the National Research Initiative (NRI) Competitive Grants Program at $500 million per year. If the NRI is to be fully funded, where in the USDA research budget could money be transferred from?**

It is neither apparent nor visible where funding could come from to fully fund the NRI Competitive Grants Program. Redirecting the money from other research sources would severely cripple the agricultural research enterprise. Reallocating money from other sources beyond agricultural research is a choice best left to Congress.

39. **What other options for funding the NRI should Congress consider?**

It has been proposed that Congress authorize the Agriculture Competitive Initiative for supporting applied agricultural research and extension. This authorization would meet some of the principle purposes of the NRI Competitive Grants Program, and could be funded as an alternative to commodity support programs now scheduled for "ramping down."

40. **Have NRI appropriations been used to expand agricultural research or have they been used to continue existing programs?**

The answer to this question varies by institutional strategy, and the preferences of those research managers on the desired mix of activities. At some institutions, the NRI has definitely expanded research in emerging technologies (e.g. biotechnology) to allow research otherwise not possible.

Agricultural Research Service (ARS) Laboratories

41. **Should the USDA have research laboratories or should it provide competitive funding to existing entities such as universities?**

This is an important and debatable point that is not easily resolved. ARS has provided valuable agricultural research knowledge for the nation. Collectively, we appreciate the pluralism of the system and the national perspective provided from the USDA. The ARS prides itself in being responsive to Congressional demands, and the quality of science performed by ARS is broadly appreciated. In many instances, ARS scientists are already integrated into Land Grant campuses.

There are, however, perceptions of duplication of activities and an undesirable separation of ARS from the federal-state partnership. Planning is said to be independent to the two entities, and that there exists wasteful competition.

These factors were considered in preparing the response to the subsequent question.

42. **Should more ARS laboratories be co-located at land grant universities? What should be the relationship between ARS and land grant university scientists? Between ARS research coordination? How can ARS laboratory functions be more effectively linked to State Agricultural Experiment Stations?**

The Land Grant University System has been openly receptive to partnerships with ARS scientists at virtually all locations. The System believes that this provides reduced costs, enhanced scholarship, and has often gained a broader perspectives through their participation in university research/graduate programs.

At the individual scientist level, considerable partnering exist among Land Grant University faculty and ARS scientists. Unfortunately, this strong association diminishes progressively as one goes up the hierarchical ladder. It is generally believed that more joint planning between the federal-state partnership and ARS would be beneficial. Opportunities also exist for joint appointments that would allow ARS scientists to participate in teaching (to help keep them scientifically current). There is also a need to have more budget flexibility for collaborative programs. By streamlining the USDA's cooperative agreements, Land Grant institutions would be more willing to work with ARS in joint activities. For instance, some State Agriculture Experiment Stations are reluctant to establish cooperative agreements with ARS involving employment, as the university then becomes liable for workman's compensation claims at the end of the cooperative agreement.

Serious consideration should be given to authorizing formal joint ARS/Land Grant University appointments, to further the union of purpose and functions of agricultural research, teaching and extension with a national perspective. Formal joint appointments would allow multiple benefits to flow to the System as a whole. Some of the benefits of placing more ARS scientists on Land Grant University campuses would be: facilitated interactions with students, especially graduate students (said to stimulate the research scientist); closer interaction with the Extension Service (an effective means for technology transfer); and better joint planning and implementation of research projects with Land Grant University colleagues (through proximity).

43. **Are ARS laboratory facilities effectively used in performing needed research? If not, please explain and offer suggestions for better use?**

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The answer to this question varies by individual laboratories and participating scientists. For the most part, ARS laboratories are viewed positively for their performance of research, and their responsiveness to Agency objectives. No suggestions for improvement are offered.

Extension Service (Extension functions with CSREES)

44. The USDA Extension Service's (ES) mission is, among other things, to disseminate research results to farmers and other customers. In your opinion, is the ES effective in carrying out this mission? (Please explain).

It is generally held that the Extension Service has been very effective in disseminating information to farmers and agricultural-product consumers. The Extension Service also has been responsive to evolving needs (e.g. family, youth, communities, rural development). Extension represents a model for Land Grant Universities to work beyond agriculture in meeting other societal needs (e.g. criminal justice; engineering; business). This is not to say that colleges of agriculture should take up an expanded public agenda in response to new public expectations, but that Land Grant Universities should apply the extension model to other areas, beyond agriculture, as it has been proven to be very successful.

45. Should the ES be involved in addressing the problems and challenges confronting urban populations?

Yes, within the scope of the mandate they possess. There must be a recognition that expectations are changing and that extension has sought to meet those expectations through program redirection. As urban agriculture has emerged in the Northeast Region, extension has provided educational services to the region's "Green Industries" (i.e., plant nurseries, direct marketing of produce, ornamental plants). Other forces, such as new demands for services to urban households, caused an expansion of traditional extension services beyond rural communities, and this was met by extension through an expanded mandate.

One major complication for agricultural research is in the difficulties of providing a research base for extension in these expanded-mandate areas. This has proven difficult in a Land Grant University setting, where discipline expertise for a research area often lies outside a traditional college of agriculture. This presents a dilemma for the System, inasmuch as one function (i.e., extension) does not dictate the agenda for another function (i.e., research). Providing a research base for the entire extension agenda has remained elusive. This does not, however, represent a failing of the System's structure, but more an unmet need that reflects constrained resources, at the comprehensive, institutional level.

46. What, if any, role should ES play in dealing with the social issues facing farmers and rural communities?

ES has an essential role to play in resolving social issues that would benefit from more research support addressing the questions facing farmers in rural communities. These services can best be met by the Land Grant University System's Extension Service, inasmuch as the Economic Research Service and the Agricultural Research Service are not have the mandate or capacity to meet this need.

47. **Should the ES's mission statement be changed to focus activities on production agriculture?**

Reverting the ES mission statement to production agriculture would abandon the societal needs for youth, family, communities and rural development. This does not seem reasonable or justified. Moreover, the activities of extension in urban settings brings the positive prospects of a better understanding of agriculture in urban environments. It also fosters an appreciation of the "Green Industry" in urban centers, where it is often misunderstood, or even derided.

48. **What should ES not be involved in?**

Extension should not be involved in: enforcing regulations; competition with the private sector; distributing money; fundamental research; or forcing political decisions (i.e., lobbying), among others.

Joint planning between research and extension is an important activity that needs to be further encouraged within the federal-state partnership. This is not to say that the research agenda should be dictated by extension, or that extension activities should be dictated by research planning. Rather, mutual agreement should be reached on a shared vision regarding where the federal-state partnership intends to go. It is unreasonable to expect exact congruence with the extension and research plans. For example, investments in fundamental research have little need for corresponding extension investments; at least until some applications can be foreseen.

Dissemination of Research Results

49. **Do you have any suggestions on how USDA's dissemination of Federal agricultural research results can be improved?**

Research results in the future will undoubtedly be disseminated more frequently through electronic means (e.g., Internet, video). Less emphasis in the future should be given to printed material or face to face meetings.

50. **Who is, or will be, responsible for developing a marketing plan for agriculture and its science and education programs to the American people?**

There is, at present, no marketing program for agriculture, but discussions have begun on how this might be approached. A collective effort of participants in the federal-state partnership will need to devote some resources to this important need. Leadership for this responsibility should come from the USDA.

Current Research Information System (CRIS)

51. **ARS uses CRIS to provide information about USDA research projects. How, if at all, do you use CRIS?**

The Northeast Region presently uses CRIS to: review recent research project activities; analyze research investments; avoid unnecessary research project duplication; increase the efficiency of research investments; and evaluate research gaps that need to be filled.

52. **In your opinion, is CRIS effective in helping you obtain information on Federal agricultural research projects? If not, what changes are needed to this information system that would provide quality data on Federal and State agricultural research? (Please explain)**

CRIS provides an important information resources to the federal-state partnership. The CRIS staff provide excellent services that are responsive and rapid to the partnership's need. The system is considered to be the best set of descriptive data available on U.S. agricultural research, and the information is essential for research management.

The present criticism of CRIS is that the information provided is not current (a minimum of two years old for financial information), the categories and descriptors of research activities are outdated, and that the data and results are not accomplishment (outcome) based. Moreover, the system is not open, as the financial information is considered confidential, and the retrieval of information is not easily used for identifying scientific strengths (as individuals or institutions). To the latter point, it should be possible to query the CRIS system for points of contact for scientists to gain information in a specific area of science. Admittedly, this is not easily done through CRIS.

One of the greatest criticisms of CRIS is that it does not use current information retrieval technology, especially as computer software. The federal-state partnership needs a truly current information system operating in real time that is principle investigator searchable (who is doing what) and to identify the accomplishments of research investments in terms of impact and consequences. All of this is "doable", but not currently available through the CRIS system

53. **Is there/should there be an appropriate and adequate management information system(s) in place to report and collate results from Federal investments in research, extension, and higher education sponsored by the USDA (and related research agencies)?**

Ideally, a new single, integrated system should be created that would meet the needs of research, extension and higher education with a national perspective and have an open architecture that would allow individuals and interest groups to interrogate a common database to determine how public funds (all sources) are being used to address priority issues of local, regional or national importance. Participation by other related research agencies might be desirable, but not practical at this time. However, this limitation should not stall a concerted effort at reengineering the national information system for agricultural research, extension, and higher education.

54. Does the CRIS system and other USDA reporting systems provide an adequate accounting of the research and extension work that is being done in America?

As indicated in the previous responses, the present system is not adequate for accounting for research investments, if the expectation is for outcomes, impacts and consequences. There is no equivalent system for extension or higher education. A new information system would be highly desirable. This comment recognizes the magnitude of the challenge and the extensive resources that will be required to meet future needs. There are no alternatives. The needs of the System are growing, and changing. And the requirements of the Government Performance and Results Act will demand a better system for tracking and reporting agricultural research outcomes and impacts.

International Relations

55. How can the USDA be most effective in the short and long term through its support of international activities?

International research activities need to be defined broadly (as mentioned earlier) to include our important trading partners as research equals. Extending new research authorities through the 1995 Farm Bill could help promote greater efficiency in pre-commercial research, leading to the internationalization of research activities for mutual benefit. This would greatly increase the effectiveness and efficiency of U.S. research investments in both the short and the long term. Many examples could be cited, including activities such as plant and animal genome mapping, germplasm sharing, reciprocal testing, and computer model verification.

56. Currently, USAID and other programs extend agriculture and agricultural development beyond the nation's borders. What continued or expanded role should USDA play in international research, education and extension?

The present focus on USAID is on third world agricultural development, and second world assistance to the republics of the former Soviet Union and the Eastern Bloc countries. From an agricultural science standpoint, this is a narrow portfolio that does not include our major trading partners that have been, to some extent, neglected in the process of research planning. Consider the maritime provinces of Canada as an example. The agricultural research priorities of that region are in many ways similar to the Northeastern United States region. In the perspective of the North America Trade Agreement, one needs to ask, should there not be more coordination of research with our Canadian partners for precommercial public sector agricultural research ? (See previous examples)

57. **What is the role of USAID in funding agricultural research and extension? Has USAID maintained support for agriculture or has the agency moved away from agricultural related programs? What is the role of long-term agriculture R&D in developing countries in developing new markets for U.S. products? Should USAID contract through USDA/REE for long term agriculture R&D?**

There is the perception in the Land Grant Community that USAID is in the process of evolving away from traditional roles in agricultural research and extension as a consequence of the end of the Cold War. It is not possible, as outsiders, to predict the long term role of agriculture research and development for USAID, but there is a shared concern that this responsibility may continue to diminish considerably. USAID has provided important funding for the network of International Agricultural Research Centers, and to the Land Grant Universities as bilateral programs through specific funding mechanisms. In-country programs have also supported Land Grant University activities in agricultural research and development.

Given the end of the Cold War, this is perhaps the best time to revise the U.S. international agricultural research and development strategy in ways to better take advantage of the strengths of the federal-state partnership, with an international perspective. There appears to be a greater interest in fostering collaboration in agricultural research and education (both as teaching and extension) as a way for tapping into the expertise and strengths of the Land Grant Universities and their faculty. A reorganization of international agricultural research endeavors could lead to some new structures and support for new organizations designed more for meeting the nation's goals in areas such as global competitiveness, job generation, and environmental preservation, as well as addressing the major international concerns of looming world food shortages, in the face of continuing and rapid population growth in most developing countries.

An innovative proposal, called "Global Research on the Environmental and Agricultural Nexus for the 21st Century (GREAN), has been advanced to meet this emerging need for a new mechanism for international agricultural research to foster productivity growth in an environmentally sustained manner. This proposal deserves very strong support, and appropriate authorities need to be provided through the 1995 Farm Bill. A point-of-contact for this initiative is Dr. W. Ronnie Coffman, Director of Cornell University's Agricultural Experiment Station at 607-255-2554, or e-mail wrc2@cornell.edu for details.

SOUTHERN ASSOCIATION
AGRICULTURAL EXPERIMENT STATION DIRECTORS

Office of the Executive Director

Agricultural Experiment Stations of

Alabama
Arkansas
Florida
Georgia
Kentucky
Louisiana
Mississippi
North Carolina
Oklahoma
Puerto Rico
South Carolina
Tennessee
Texas
Virginia
Virgin Islands

October 25, 1995

The Honorable Pat Roberts
Chairman, Committee on Agriculture
The Honorable E. (Kika) de la Garza
Ranking Member, Committee on Agriculture
The Honorable Wayne Allard
Subcommittee Chairman, Committee on Agriculture
The Honorable Tim Johnson
Subcommittee Ranking Member, Committee on Agriculture
U.S. House of Representatives
1301 Longworth House Office Building
Washington, DC 20515-6001

Gentlemen:

I am responding to your letter of July 12, 1995 on behalf of the Southern Association of Agricultural Experiment Station Directors. Your letter asked for responses to your list of open-ended questions on the Agricultural Research, Education, and Extension System.

The list of questions has been shared with the operating officers of the fifteen members of our Association, which include the Southern states, the U.S. Virgin Islands, and the Commonwealth of Puerto Rico. The responses represent a general consensus among these administrators.

We hope that you will find our assessment and thoughts useful to the deliberations of the Committee. We want to express appreciation to each of you for your leadership in these difficult and exciting times. If there is any other information or input that we can provide to be of assistance, I hope you will feel free to call on us.

Thank you again.

Sincerely,

Neville P. Clarke
Executive Director

ATTCH: Response of the Southern Association of Agricultural Experiment Station Directors

Centeq Research Plaza, Suite 241
The Texas A&M University System
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AGRICULTURAL RESEARCH, EDUCATION & EXTENSION
QUESTIONS FOR DISCUSSION

Response of The Southern Association of
Agricultural Experiment Station Directors

October 3, 1995

FEDERAL AGRICULTURAL RESEARCH GOALS

1. Role of Federal Government in Agricultural Research:

The federal government should have a leadership role in defining and supporting the needs for and opportunities in the use of research to provide new knowledge and technology. The federal government should have a strong program of intramural research which is complementary to the national research conducted by the states and industry. The federal government's partnership with the states in the distributed system of research, education, and extension has a continuing high pay-off and should be ongoing. Agricultural research addresses problems and opportunities which may be very site-specific, regional, or national in scope. Federal funds should support research that addresses issues at the multi-state level. The federal government should support the spectrum of research from discovery to application. Higher risk agricultural research, at the discovery end of the spectrum, should receive priority for federal funds, as is the case for federally supported science in general. The federal government should evaluate the projected benefits of research before expenditures are made and should assess the impact of research results in meeting stated goals.

2. Coordination with Federal Agencies:

There should be an ongoing and effective coordination of planning and evaluation of related research sponsored by federal agencies. Increasingly, the production, processing, and marketing of food and fiber is related to broader agendas such as health, environmental quality, and maintenance of international competitiveness. Increasingly, the disciplines related to agricultural science must draw on the broader science capability outside of traditional agriculture to provide answers and new innovations for the production of food and fiber. Both intramural research and extramural research conducted and sponsored by other federal agencies and related national laboratories is highly relevant to agriculture. In many cases there would be significant benefit in moving past coordination to joint planning of related activities.

3. FAIR 95 as an Example of Goal Identification:

The concepts behind FAIR 95 centered on bringing to a common debate those interested in production, environmental concerns, consumer needs and preferences and the scientific communities charged to provide the new knowledge and technology needed to address these multiple agendas. Focused in the area of animal agriculture, the resulting agenda represents a useful consensus among participants. Like other related consensus seeking activities, FAIR 95 was useful but less than perfect in developing broad acceptance of a single agenda and tended, to some degree, to reflect the positions of a relatively strong leadership in the consensus seeking process. The product of FAIR 95 has served well as a vehicle for communicating the common agenda of the animal industries and the related research communities involved in animal sciences research. FAIR 95 had a significant impact on the recent major revision of the 1994 ESCOP-CSRS Strategic Research Plan. Other consensus seeking methods have provided more regional input and a more in-depth engagement with customers and the science community. Taken on balance, FAIR 95 was clearly a successful process and produced a useful product. There are other goal seeking processes which could be added to the FAIR 95 process to enhance the resulting consensus.

4. Modifying the Goals of FAIR 95:

Obviously, FAIR 95 is oriented to animal agriculture and its related research. Thus, the stated goals would need to be modified to reflect the broader agenda. The general goals stated in the question do not go far enough into detail to provide for meaningful definition except at the concept or political level. The FAIR 95 document does expand on these general statements. Rather than modify or accept FAIR 95 as a template, the overall agenda for agricultural research deserves a broader view; not a modification of a rather highly specialized approach.

PRIORITY SETTING

5. Focusing Federally Sponsored Research on Priority Issues:

Federally sponsored research should not be focused only on the "issues of highest priority for producers, processors, and consumers". Rather, it is critically important to recognize and accept that the research agenda should represent a balanced portfolio that looks at short- and long-term needs and opportunities, that recognizes opportunities to succeed in areas of moderate priority and that impasses may preclude progress in high areas of priority needs that may not be researchable. An optimal federal investment strategy would allow flexibility to react to unplanned emergencies, take advantage of unexpected opportunity and to maintain a broad general direction consistent with perceived priorities of both the customers and those who can see the opportunities in science. The priority setting mechanism can most definitely be improved. Better linkages to the growing list of involved stakeholders is needed and might be achieved through more effective use of "customer conferences".

6. Focus of Federal Funds on Specific Technological and Industrial Needs:

The federal science establishment has the established precedence of conducting that research which is too long term or high risk to be undertaken by industry but which offers the opportunity for the quantum breakthroughs that have been so important to the U.S. Highly site-specific research and research to take principles to products should be funded more by other sources, including states and industry. But there should be a healthy overlap of funding sources across the spectrum between early discovery and application with involvement in all parts by the federal system.

7. Federal Research and the Quantum Leaps in Benefits:

If the full spectrum of funding for the state-federal partnership in agricultural research is considered, it appears that the federal government is under-investing in research that is likely to lead to the quantum leaps forward. The increasingly short term focus of policy and decision makers, indeed the flavor of many of the questions in this list, illustrate the emphasis placed on immediate answers to urgent needs. In addition to this, there is a need to recognize the importance of longer-term investment in discovery type research which will ultimately have the greater impact. An obvious balance must be defined and then achieved, but at this point, with the NRI still only funded at 20% of its authorized amount, the federal programs are substantially short of the mark in break-through research.

8. The Role of USDA/REE in Insuring Competitiveness with Decreasing Price Support Programs:

Price support programs have provided an assured floor for income to farmers and ranchers; other programs have provided insurance against extremes of weather. If GATT, NAFTA, and reductions in these programs takes U.S. agriculture to the international marketplace with less protection, then the programs of REE must replace the loss of insurance with new knowledge and technology that reduces both the economic and biological risk of farming and ranching. Methods to ensure international competitiveness through research, education, and extension are achievable in both the short and long term. Enhanced competitiveness has a strong component of product quality and tailoring to meet consumer demands; another clear opportunity for researchable programs to contribute. The development of policy options that position U.S. agriculture to be competitive in the international marketplace should be developed. If price support programs are substantially reduced, as projected, a portion of these savings should be invested in expanded programs of research, education, and extension as called for in the Agricultural Competitiveness Initiative.

9. Integration of Federal-State-Industry Resources for Regional Research, Teaching, and Extension:

Funding is provided by state government to address issues of importance to the state. Industry invests stockholder funds in research that has the ultimate goal of making profits. Federal funds address areas of national priority, with precedence suggesting that they be directed to higher risk areas. Integrating funds from these three sources requires finding common ground or intersecting/overlapping areas of interest and relevance. Previously established tax incentives for industry to invest in research could be restored to promote further integration. Cost sharing between state and federal sources could be expanded in areas of mutual interest. Developing a more effective focal point in USDA for partnering between industry and the SAESs could be developed to comparable levels now directed to ARS and their CRADAs. The National Science and Technology Councils could become more active in identifying and promoting engagements between USDA and its partners, and other parts of federal government engaged in research relevant to producing food in an environmentally sound manner. As overall funding becomes more scarce, and as environmental, safety and production goals of agriculture continue to converge, the opportunities for integrated funding across agencies and departments of federal government should increase.

10. Federal Agricultural Research Supporting Other USDA and Other Federal Agencies:

ARS engages in a set of ongoing dialogues with the action agencies of the Department and intends by these engagements to be responsive to their needs. The level of effectiveness of this set of engagements is subject to debate but the process is in place. The SAESs, through their partnership arrangement with CSREES are much less involved in engaging the action agencies of the Department. Much complimentarity in use of the products of their research could and should be achieved through better linkage with action agencies of the department. Similarly, there are broad areas of potential engagement with other federal agencies who have responsibilities related to agriculture. The Environmental Protection Agency, the Department of Health and Human Services, the Department of Interior, and the Department of Energy are examples of institutions where opportunities for better engagement exist. Not only could agricultural research support the mission of these agencies, but new funding might be found to address these areas of mutual interest and responsibility.

11. CSREES Support of the Agricultural Enterprise:

The Land Grant University System made the case to the Congress for the organization of CSREES when overall USDA reorganization was undertaken. The point of the LGU position was that there should be an agency within USDA that recognizes and deals with the unique partnership arrangement that exists between the states and the federal government for agricultural research, education, and extension. A principle role of CSREES should be to implement the goal of better integration of the several components of the partnership thereby ensuring the best use of limited resources and achieving the expected efficiencies resulting therefrom. A significant distinction of this unique organization is that it should direct its energies to partnering with, not administering to, the LGU system. A mid-course change in direction is indicated to direct the agency more to the partnership mode -- more partnering and less top-down management. There should be a much greater use of LGU faculty assigned to the Department on an interim basis to provide credible scientific leadership in managing CSREES programs; the NSF and NIH could serve as excellent models for this type of management and leadership style. As indicated elsewhere, there should be an active engagement of federal customers within and outside the Department of Agriculture by CSREES. The functions of this partnership agency should clearly be exempted from the limitations of engagement imposed by the Federal Advisory Committee Act (FACA)--which, in some cases, is used as an excuse for non-engagement rather than a limitation. As noted in legislative language associated with the bill establishing the agency, arrangements should be made for active participation by the state partners in the policy and decision making undertaken at the level of the Undersecretary's office.

12. Proper Place for Integrated Systems Programs, Role of the Federal Extension Function:

It should be clearly recognized that system research transcends all parts of science from discovery to application. Too often this is overlooked and it is assumed that research on integrated systems is limited to site-specific application. Thus, systems research has a vitally important place in the full spectrum of research activity. On the application end of the spectrum, there is a need for full partnering by/with Extension in addressing the applied research and site-specific aspects of integrated systems programs. It is more difficult to sort out the role of state vs federal responsibilities the closer programs go to application systems. Highly site-specific systems work should probably be dominated by an extension effort, although full partnering has useful results. Integrated systems programs have been divided into component research and systems research by some planners. Individual pieces of technology developed separately may be critical to the function of integrated systems. Based on these observations, it would not seem useful to attempt to categorize integrated systems research in any special part of the research-extension matrix but to recognize that there are important components in all parts.

ADVISORY BOARDS

13. Effectiveness of Research and Extension Advisory and Coordinating Boards:

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Advisory functions for the research and extension establishment have been divided into users and performers of research and extension (also higher education and international agriculture). These bodies have been useful, but not as useful as they could be with better direction and different membership. An attached separate paper on advisory bodies is submitted to supplement this answer (Attachment 1). Clearly, changes are needed in the role of advisory functions for the new USDA/REE and especially for CSREES to implement the intent of Congress in the recent reorganization of Science and Education within the USDA.

14. Changes Resulting from Advisory Boards, Number of Boards:

It is difficult to attribute unique contributions of the current advisory functions to the changes in priorities of the federal agricultural research, education, and extension establishment. It is possible to say that the recommendations of these boards have preceded and been consistent with a number of new directions and changes in emphasis in these programs. The shift in emphasis to food safety and nutrition, to concerns related to the environmental consequences of agricultural production, and to the need for greater emphasis on adding value to the raw products of agricultural production are examples of changes that have occurred in the same time frame as the recommendations of advisory bodies. Advisory bodies from the performer side of the ledger have provided a basis for consensus building among various federal and state players on the research, education, and extension agenda and have thus had impact downward as well as upward in the administrative and institutional chains. There is clear evidence of joint planning associated with advisory bodies resulting in avoidance of unnecessary duplication of effort.

15. Options for Congressional Improvement of USDA Planning and Prioritization:

The separate paper noted in the answer to question 13 specifically deals with recommendations for improving this process through revision in Title XVI of the Farm Bill.

16. Role of Stakeholder Advisory Boards, Customers and Partners:

Stakeholders have an intimate involvement with setting of research agendas at the state level. They are developing an increasingly important and vigorous role at the national level. The number and diversity of stakeholders is expanding almost exponentially. In all sectors, there is a growing belief that stakeholders should have a greater voice in defining the research agenda. The unique partnership arrangement between state and federal government for agricultural research calls for special consideration in mixing customers and partners. Partners in research bring resources to the table for which each partner has responsibility and makes the determination about how these resources will be separately or jointly spent. Stakeholders are the common customers of both the state and federal partners -- and partnership means equal sharing. Thus, stakeholders should be dealt with as customers of the partners and should be involved in making recommendations on needs and relative priorities. In turn the partners must (separately from the customers) make the final investment decisions about the resources for which they have unique fiduciary responsibilities. Stakeholders and LGU partners are not common advisors to the federal government and should not be treated as such.

17. Advisory Boards in International Agriculture:

In the present environment of highly constrained resources, emphasis on international agricultural research and development is oriented towards those activities in which the expenditure of funds is expected to produce a clear and obvious advantage to the U.S. This may be evidenced in the form of cooperative efforts between the research establishments of national programs; or it may be manifest in creating new economic vitality in developing countries resulting from an enhanced ability to produce food and fiber. In either case, there is a need to better factor the international component into the total equation when plans and priorities are established for the partnership in research, education, and extension. Separate advisory functions on the international dimension would not be as useful as integrating this into the total advisory function.

FUNDING CONSIDERATIONS

18. Appropriate Mix of Federally Funded Basic and Applied Research:

Rather than use the terms "basic" and "applied", the answer seems more meaningful if the terms "discovery" and "application" are used. The role of the federal government in sponsoring higher risk research at the discovery end of the spectrum has been noted in several previous answers. As one looks to the application end of the spectrum, a limiting condition for expending federal funds is on research which is highly site-specific. However, there is much research being done to develop principles of application that are not site-specific and, therefore, well suited to the general paradigm of federal funding. The answer to this question is probably different depending on the part of agricultural science and the segment of industry. On balance, as noted elsewhere, it is the general consensus that federal support of research at the discovery end of the spectrum is insufficient relative to the total state-federal partnership. However, members of the LGUs would not agree that a categorical shift from current research on applications should be undertaken to achieve better balance. Research funding across the spectrum has been so badly eroded in recent years, at both the state and federal levels, that redirecting existing resources does not seem an attractive option.

19. How to Enhance Effectiveness of Research at Current or Reduced Levels:

To begin with, the research capacity of the LGU system has been eroded by at least 20-25% over the period of the last five years. The fat has been trimmed from the system. Demands on the State Agricultural Experiment Stations have increased both horizontally and vertically with their customers. Thus, the ability to reinvest or redirect research to different agendas is much more constrained that in earlier times. Much of what can be done has been done to improve the efficiency of research -- change has been necessitated by shrinking resources. Lower priority activities have already been eliminated because of these fiscal pressures. It is unfortunate that, at the national level and with aggregated and consolidated data, it is difficult to clearly show the impact of reduced funding that has occurred at the state level. There is also the need to recognize that the state agricultural experiment stations respond to state and local institutional needs and are not dominated by the federal agenda. Thus, common ground must be found to effect changes within the partnership. Several options are being examined to enhance efficiency. One of the more interesting is the consolidation of research across a region to one location, where multiple states can be well served. This is surfacing not only in research, but in higher education and extension programs. The federal system could create financial incentives to accelerate this process of consolidation.

20. Assuring Completion of Multi-Year Programs:

In the past, agricultural research planning has been based on the assumption that certain areas of science and its application to industrial use would be continued on an open-ended basis. Particularly at the level of aggregation used in national planning, it has been difficult to visualize the dynamics of change in broad areas of science. Accountability for the expenditure of public funds at all levels of government is called for increasingly. To provide better support for research, especially longer term efforts, improved methods of planning and goal setting must be achieved. It is especially important to develop methods and an experience base which more clearly establishes the contribution of science at the discovery end of the spectrum to the general welfare of U.S. agriculture and to the tax paying public. Improved and more credible methods for both ex-ante and ex-post analysis of the results of research are needed. A new management information system for the USDA is required that is based on established goals and measures of success in meeting these goals. It must be recognized, on the other hand, that, taken to extremes, the process of goal setting and reporting can consume very large quantities of resource that otherwise might be invested in research.

21. Accountability for Expenditure of Federal Funds:

Research outcomes are understandably somewhat unpredictable at the level of individual projects, especially at the discovery end of the spectrum. If positive answers were assured, research would not be necessary. However, taken in the aggregate, research has been shown over many years, in all regions of the country and across a myriad of commodities, to be highly useful, and has served as a major factor in the success of American agriculture. Traditionally, the aggregate impact of research has been calculated as an internal rate of return on investment -- and the numbers are very persuasive, showing ROIs of 30-50% per annum. The more sophisticated estimates of such returns have built into their calculation a variable that deals with lag time -- the time between discovery and application. The ability to measure the non-economic impact of research is still evolving. Measurement of the broader utility of research involves development of non-economic measures of output to account for such values as environmental quality and resource conservation. There is increasing demand to estimate the pay-off of research as part of the planning process (ex-ante) as well as to increase the sophistication of the retrospective (ex-poste) evaluation. It is more difficult to assess the impact of research at the discovery end of the spectrum, especially in the prediction of its utility before the research is done (ex-ante). There is no recognized standard of accountability for the efficient and effective use of federal research funds. In addition to the kind of measures noted above, there remains the most important and reliable method -- peer evaluation of quality and utility.

22. Balance Between Funding Mechanisms:

It would be difficult to get a strong consensus among experiment station directors in answering this question. The answer varies according to the capabilities of the institution, the size and complexity of agriculture in the state, and the leadership involved. The attached paper (Attachment 2) depicts the need for a balanced portfolio, recognizing that formula funds provide a flexibility and opportunity to respond to needs and opportunities; that special research grants provide a mechanism for highly focused national priority research; and that competitive grants allow for the selection of research to be done on the basis of both merit and quality. Many special research grants are, in fact, awarded competitively; and all formula funded projects are subject to peer and USDA review before approval. Hatch funds are authorized at about $500 million per year, as is the NRI. Fully funded, these authorizations would be supported by most experiment station directors.

23. Guidelines for Appropriations for "Specified Programs":

In an improved management posture, the USDA would be able to use multiple funding mechanisms as described in the previous question to address programs of high priority. The emerging management strategy for integrated pest management is illustrative of how this can be done. If programs are one dimension of a matrix with source of funds the other, the ability to tailor broad attacks on key national problems is enhanced if the full dimensions of the matrix are employed. Occasionally, there appears a problem that lends itself to a very short term "fix" -- and the special research grants approach fits this need well. Recently, ESCOP introduced the concept of "contract research" to enhance the responsiveness of the SAESs to national emergencies such as the E coli problem. Contract research would purchase a prescribed "deliverable" on an established schedule. The limiting factor in using this approach has been the difficulty in securing appropriations on an annual basis for problems that have not yet been identified. The appearance of providing a "slush-fund" in today's environment has not been appealing. Increasingly, there is a tendency for the action agencies of the department to have small research funds to support this kind of effort. The question of whether this "splintering" of the total pool of research resources is good or bad is in the eyes of the beholder.

24. Federal Funds for Facilities:

There is no question but what the physical infrastructure for research and education has deteriorated badly in the Land Grant Universities, taken as a whole. There is a growing bi-modal distribution of LGUs in this respect, with the larger well-funded institutions continuing to grow, albeit at a slower pace; and the smaller institutions losing ground in less affluent states where agriculture is less important. The major problem with federal funding of facilities is the large amount of money it takes to make a difference. A major research and education facility costs between $15 and $30 million. Funding ten such programs per year, one in every five states, would amount to $200 million. Most experiment station directors would not support diverting this kind of money from existing programs--where it makes a lot of difference; it seems unlikely that it will be provided from new funds. Some experiment station directors favor equipment grants over facilities grants, believing that the bricks and mortar should be the responsibility of the institution. Certainly, cost sharing is an accepted feature of any federally sponsored facilities program -- with the mix being at least 50:50. If a federal facilities grant program is instituted, a competitive approach would be preferable to the present system. However, unless the ground rules are changed by the Congress, there is no reason to expect that institutions seeing the ability to acquire facilities funds through this route will cease to do so. Consolidation of research at the regional level to one major location has promise and is increasingly feasible, as constraints continue on overall funding. A regional research and education facilities grant program would be one mechanism for stimulating such consolidation. This would result in the kind of efficiencies currently being sought both by the Congress and state legislatures.

25. Partnerships Including Foundations:

Private foundations more often favor spending funds on projects that have a finite lifetime -- a logical starting and finishing point. In some cases, such foundations have been willing to consider projects or programs of up to five years in duration. Foundations, as is the case with other funding agencies, are interested in leveraging their funds -- and so some degree of partnering is appealing to them. However, it is important that they maintain a clear identity of the products of their investment. In most experiment station director's views, foundation money is most likely to come to institutions, not multi-institutional programs, and is not likely to provide a major offset to ongoing federal or state funding.

26. Check-off Funds as Sources of Support for Research:

It is difficult to obtain accurate figures for the aggregate size of support for research from check-off funds. As indicated in the question, a substantial, often dominant, share of such funds is directed to marketing and promotion, rather than research. Estimates of $40-50 million per year are probably the upper limit. Check-off funds are usually managed by producer boards whose focus is often very short term; such boards attempt to be responsive to producers who want assurance of immediate pay-off. Thus, two factors mitigate against long term investment from these funds, the small amount of money involved relative to the total agricultural research investment and the "here and now" philosophy of those who manage the funds. Check-off funds are very useful in establishing communication and "ownership" of the SAES research programs by producers. They provide one means of communicating about at least a portion of the overall research agenda from industry to the SAESs. With better communication, some commodity groups have, in fact, begun to make investments in longer term research; there is opportunity for the SAESs to do a better job in communicating to expand this part of the industry portfolio.

DELIVERING AGRICULTURAL RESEARCH

27. USDA Actions to Improve Management/Delivery of Agricultural Research:

If overkill could be avoided, the implementation of the Government Performance and Results Act (GPRA) offers a mechanism for better planning and priority setting at relatively broad levels. The process will establish general expectations on deliverables which should provide a better communication among stakeholders about what is needed and what is possible. Overdone, this process will be onerous and costly and will likely sink under its own weight. A credible management information system (MIS) would be enormously helpful, if it were designed to provide the kind of outcome oriented user information that can be effectively used in the technology transfer process. Such a system would also be invaluable in the overall process of advocacy of programs. Both GPRA and the new MIS should be initiated at the grass roots and thus provide enhanced linkage between research, education, and extension at state and regional levels as well as at the national level. Continuing involvement of extension specialists in terminal applied research also facilitates the process of technology transfer and should be continued and encouraged. Increased involvement of Extension and Experiment Station cooperation at the regional level will provide improved efficiency and help avoid unneeded duplication. As the reorganization of USDA/REE continues to evolve, special attention should be given to strengthening the linkage between research and extension within CSREES and between CSREES and other parts of REE. However, the recent Congressional action to establish a separate agency for the partnership functions should be maintained.

28. Congressional Actions to Improve Delivery, Results, and Benefits of Federally Funded Agricultural Research:

Congress should mandate the expedited development and use of a management information system, as described above. Congress could include in the next revision of Title XVI an enlightened mechanism for making use of advisory committees and for better involvement of the talents of the university community in the management of USDA programs (via the IPA route). Increased emphasis on regional activities with creation of funding and other incentives to encourage cooperation at that level would be useful. Congress might consider requiring approaches which would de-centralize or even privatize some aspects of program management for USDA research and extension activities needed to effectively manage these programs, given the difficulty in recruiting and retaining the kind of talent into government. Relief of the partnership from the Federal Advisory Committee Act (FACA) would greatly facilitate the use of university talent.

29. Federal Role in Training Workforce for Production of Food and Fiber and Dealing with Natural Resource Management:

The federal government does very little to directly support undergraduate education in colleges of agriculture and natural resources. Indirectly, however, the support of research and extension provides very meaningful enrichment of the environment in which undergraduate education occurs. It's a fair question to ask why the limited funds available to USDA for agriculture should be spent on higher education. The answer is a compelling justification. Agriculture is seen by many students today as being of low priority because of the difficulty in earning a living farming. Graduate students often view the science of agriculture as being less exciting and rewarding than other disciplines or fields. Thus, there is urgent need to provide a mechanism to attract the best students to both graduate and undergraduate educations in agriculture. Federal funding can be effectively used as a stimulus to broader funding for this purpose.

LAND GRANT UNIVERSITIES

30. Continuing Role of Land Grant Universities, 1890 Colleges and Universities and 1994 Colleges:

There are many studies underway to address these broad questions, several are being funded by the Kellogg Foundation; the National Research Council is also involved in such a study. The Board on Agriculture of the National Association of State Universities and Land Grant Colleges has initiated a set of Futuring Activities that will address this agenda for the area of agriculture and natural resources. Many have asked if there needs to be a new social contract between the LGUs and the general public; others have suggested there is need to return to the founding principles of the

LGUs as the universities of the people. Some question what the role for agricultural research and extension in LGUs will be, with the rapid industrialization of agriculture in the U.S. It has been noted that there is a growing bi-modality of LGUs in terms of their overall size and level of sophistication. Even though the decisions pertaining to the future of LGUs rest at the state level, many have asked whether there is need for such an institution in each state. Most experiment station directors believe that we are in the midst of profound change in the LGUs but that despite this, the underlying founding principles and rationale relative to the SAES mission remains firmly in place -- and that it is the changing definition of stakeholders and the evolving methods to achieve missions and goals that is at issue. The continuing role of the 1890 and 1994 institutions is based on the goal of better serving minority populations. Within that purview, it is increasingly important to assure that effective linkages in research, education, and extension are ensured and enhanced, and that these institutions make full and effective use of the federal resources under their stewardship.

31. Formula for Allocation of Funds to Land Grant Universities:

The basis for allocation of formula funds to the states has not been changed in many years. If the current formula were reviewed and re-evaluated, there would probably be changes in distribution of funds. Some believe that more emphasis should be placed on the economic activity generated by agriculture and less on the number of farms or farm populations. Others would defend the original basis for allocation. There would be two likely results of taking on this issue: (1) measurable but relatively small changes in distribution would likely occur and (2) the threat of redistribution would be extremely divisive among the universities and their Congressional delegations. Most experiment station directors would tend to leave the formula as it is at this time, believing that the adjustments would cause more internal stress in the land grant family than it is worth.

32. Need for Experiment Stations in Each State, Options:

This has been partly answered in several other questions. First, the decision to have or not have a state agricultural experiment station rests with the state, not the federal government. In a number of smaller states, where agriculture is not a major source of economic activity or revenue, there is the possibility that the institution may fall below a viable priority level; in no state has this occurred nor is it threatened at this point. In a number of states, there is an effort to integrate total programs of agricultural research, education, and extension. Some institutions have intentionally submerged the identity of the station, a few have abandoned the institutional title, but retain the program. As noted above, some have argued that there will emerge some dozen or so "flagship" LGUs and their stations will carry the day for the rest. A much more likely scenario might be that smaller universities will continue to have their own SAESs with more limited state and regional goals, while the larger institutions place greater emphasis on national and international agriculture. Those of us in the SAES system wish to carefully avoid the implication of a "two-class" system for the stations, believing that each station has a primary state mission and customer to serve in the best way possible. Consolidation of research at one location within related regions, more effective use of cooperative research, education, and extension between states, and focus within SAESs on areas of greatest comparative advantage all offer methods of improving the efficiency of the SAES system without necessarily forecasting the demise of some elements of the network.

33. Coordination of Agricultural Research among Federal, State and Private Institutions:

This is partly answered under questions 9, 10, and 26. There is in place today a rather large set of mechanisms that purport to provide coordination of agricultural research among federal, state and private institutions. These mechanisms do a good job of assuring the opportunity for awareness of each other's efforts; but they may not go far enough to really be effective. Fiscal constraints at all levels have probably done more to cause meaningful communication about cooperative research than any administrative mechanisms that have been established. There are four "Cs" that can be used to describe increasingly meaningful levels of engagement in this process:

(1) Communication -- you read my papers and I'll read yours,

(2) coordination -- we'll each be aware of what the other is doing before we start our own research,

(3) cooperation -- we'll help each other --you do part and I'll do part, and

(4) consolidation -- where the major focal point for a kind of research is located at one place and other institutions help fund and draw benefits from it.

From the above description, it would appear that the word "coordination" does not fully convey what is needed in the world of today's constrained resources. A more meaningful engagement is required; one which goes beyond coordination and explores opportunities to improve efficiencies through cooperation and consolidation.

The starting place for effective communication leading to cooperation and consolidation is in the development of meaningful strategic plans which can be used as an initial point of engagement. A common framework for strategic planning would facilitate communication and opportunity for engagement. This could be achieved through the broad definition of the research and extension agenda in title XVI.

34. Current Models for Cooperation in Research and Extension:

In the Southern region, the federal funds awarded to individual states for cooperative research are leveraged by a factor of 5:1 in the total portfolio of regional research which amounts to more than $63 million. These federal funds provide a stimulus for communication about cooperation. The leveraging suggests the perceived benefit of such cooperation is great in the eyes of SAES directors.

The national strategic plan for the SAES-USDA has been used as a point of departure for developing a regional strategy in the South. A set of national initiatives and regional initiatives have been derived through consensus planning with disciplinary department heads across the region and with SAES directors. In the current regional research portfolio, more than 80% of the total funds are invested in the top 50% of the initiatives based on a vote of directors on relative priority.

A Southern Management Information System (SMIS) is being developed to provide a geographical information system based method for seeking out the less obvious areas for meaningful cooperation among states. The system is available for use in every Southern state and provides multiple natural resource, land use, meteorological and geopolitical data sets that can be used for planning at both the state and regional levels. If this system is proven to be useful at the regional level in the South, it will have obvious utility at the national level.

The Southern region has more than twenty Southern Extension and Research Activities, joint efforts between research and extension at the regional level.

35. Use of Federal Funds to Promote Cooperative Regional Research and Centers of Excellence:

It is most appropriate to use federal funds for this purpose and the pay-off has been described in the answers to several preceding questions.

36. New Federal Partnerships Resulting from Integration of Societal Concerns into the USDA Agenda

As the fixed or (more likely) decreasing USDA funding for agricultural research and extension has come up against an increasingly greater demand for expanded programs outside main-stream agriculture, the need for more effective partnering has expanded to become a necessity.

37. National Science and Technology Council:

The SAESs perceive opportunities for substantially greater partnering with several federal agencies whose mandates have very meaningful intersections with Agriculture.

The Environmental Protection Agency, Health and Human Services, Energy and Defense are clear examples of potential interface. The concept of OSTP and the National Science and Technology Council to foster a more meaningful dialogue and mutual commitment of resources at that level is most attractive, if it can be done. Early analysis of the guidance from OSTP/OMB suggests that agriculture should be meaningfully engaged in more than 75% of the national priorities that have been enunciated.

Thus far, the agricultural input to the NSTC process has been kept pretty much within the Department and efforts on the part of Land Grant Universities to gain access to the process and its results have been frustrating. As indicated elsewhere, there is need to bring the partners into more meaningful engagement in this and other parts of strategy development.

NATIONAL RESEARCH INITIATIVE

38. Source of Funds for the NRI:

SAES directors have a strong consensus saying that formula funds and NRI are at the top of the list of priorities for existing programs. Most would say that formula funds have higher priority. Few SAES directors would advocate the redirection of funds from existing programs to the NRI. The Agricultural Competitiveness Initiative has been proposed as a means of infusing new resources into the research, extension and higher education system with funds derived from reductions in mandatory programs. The rationale is that, if reductions are made in areas such as commodity programs and various welfare programs, the need for research and extension will be greater than ever to maintain competitiveness of U.S. agriculture and to offset the increased risk resulting from loss of commodity supports. In this proposal, the funds would fall under the mandatory side of the ledger and be made available to the USDA through the Commodity Credit Corporation. If this occurs, a portion of the funds would be applied to the discovery end of the research programs in USDA and would, in effect, achieve some of the goals of the original NRI.

39. Other Options for Funding the NRI:

See the answer to the previous question.

40. Use of NRI funds

About 65% of the NRI funds go to Land Grant Universities. Not all of these funds are awarded to scientists with Experiment Station appointments. Thus, a very substantial amount of the funding is very likely to go to truly new projects. The SAES infrastructure provides a very substantial basis of support for scientists who compete for and receive funding through the NRI. In this case, there may be broad linkages to related areas of existing scientific effort in the SAESs, but, the nature of the requests for proposals and award mechanism provides good insurance against these funds being used to simply bolster ongoing activities.

AGRICULTURAL RESEARCH SERVICE LABORATORIES

41. Intramural Laboratories vs Extramural Competitive Funding:

Unless major infusions of new funding are introduced, ARS does not have the resources to conduct a major program of extramural research granting -- unless the scenario is one in which a grant program is substituted for the intramural program. The more sharply focused question implied is one of whether federal funds are better spent with ARS as an intramural agency or in universities. Most experiment station directors would agree that there is need for both programs. The quality of research in both the intramural and extramural programs is undoubtedly variable -- with good and bad examples existing on both sides. And, there is no doubt room for and ability to improve on both sides. The important thing is that there is a need for achieving excellence in focused areas of food and agricultural research within national laboratories (as in the case in NIH, Energy, and DOD). At the same time these intramural capabilities can and are complemented by extramural programs conducted in universities and industry. The question does not seem to be one vs the other, but how to make sure that the interface is most effective and that each does what they do best.

42. Relation of ARS and Land Grant Universities:

Generally, the maximum synergy results from the co-location of ARS and university facilities-- full time federal scientists with long term funding are in juxtaposition with creative and energetic graduate students and their faculties in a mix that brings out the best of people and institutions. In most places, ARS scientists have faculty appointments and can be active in graduate student training and research -- the stimulus that keeps good scientists on the cutting edge. The concerns expressed inside the beltway about coordination and cooperation between ARS and the SAESs do not pertain nearly to the same extent at places where institutions are co-located. True sharing and interactive cooperation are evident in both laboratory and field research in this situation. One way to further enhance the cooperation between ARS and the SAESs is to develop centers of excellence which are staffed with scientists from both institutions. An example is the ARS Albany facility for plant genetic engineering.

43. Effective Use of ARS Facilities:

The SAES directors in the Southern region do not have a basis for making a categorical judgement on this subject. We are aware that ARS has taken a management position that calls for "right-sizing" its scientific staff so that every scientist has adequate funding to do his/her job. The Service has, on balance, done a better job of this than the SAESs. In this situation, it is not surprising to find specific instances in which facilities and equipment are being less than fully utilized. In those situations, it is our perception that the ARS has been willing and interested in making such resources available to university counterparts interested in working in the mission area of the ARS laboratory. Again, we would not be prepared to state whether this is a common situation or not.

EXTENSION SERVICE (EXTENSION FUNCTIONS WITHIN CSREES)

44. Effectiveness of Extension in Disseminating Research Results:

The Land Grant University model for research, education, and extension and their interactions is the envy of the world. While it is not without its problems, it clearly has worked well in the past and will presumably do so in the future. The system does not intend to simply rest on its laurels, but recognizes that profound changes are occurring in its external and internal environments and that the three functions must also change to continue to work well and serve its expanding clientele. Extension is particularly challenged today to find the most meaningful way to serve all of agriculture, the small farmer as well as the large vertically integrated corporation.

45. Extension in the Urban Setting:

This is a question to be settled at the policy level between Congress and the leadership of the Administration. It falls outside the area of expertise and knowledge of most SAES directors.

46. Extension and Social Issues Facing Farmers and Rural Communities:

A robust system for producing food and fiber in the U.S. requires that farmers and rural communities be in shape to function effectively to provide the workforce and infrastructure to sustain production agriculture. The structure of agriculture is dramatically changing, and the face of rural America has already undergone profound change. The answer to the question would not seem so much to be whether to be involved but what to do -- to determine which part of the status quo to try to maintain and which part of the new paradigm to enhance.

47. Focus Extension on Production Agriculture:

Clearly, Extension is effectively and appropriately involved in all parts of the system that is involved with providing food and fiber to the American citizenry and to enhance U.S. income through the export of products which are excess to our needs. Extension makes major contributions in the area of post-harvest processing, marketing, agricultural policy and natural resource management. Extension focuses a very large majority of its total resource in these areas of endeavor. In our opinion, the Extension effort is focused, in the main, on production agriculture as defined in this broader context.

48. What Should Extension Not Be Involved in?

Again, this is primarily a political policy question which should be addressed by those whose responsibility it is to make such decisions. As a "side-bar", it may be necessary to find resources outside the appropriations to USDA to fund some part of the present programs that are perceived by decision makers as being outside the mission of USDA.

DISSEMINATION OF RESEARCH RESULTS

49. Improve Dissemination of Federal Agricultural Research Results:

The answers to questions 27, 28, and 29 under Delivering Agricultural Research partly address this question. It is not meaningful for most of us to think about federal agricultural results separately from the product of the total effort between the state and federal partners. If the question is directed at methods to enhance the dissemination of research done exclusively in the ARS laboratories, there are opportunities for a more effective linkage between these efforts and those of the CSES. All players have a growing responsibility for participating in the more effective marketing of the products of research.

50. Who Does the Marketing Plan for Agricultural Science and Education?

This responsibility belongs to every individual and every institution that is involved in agricultural science and education. We have a marvelous story to tell and we do an extraordinarily poor job of doing it. The overall output of impact assessment should include a marketing statement at all levels of aggregation of reporting of results. The new management information system (MIS) mentioned several times in previous answers is a key part of the answer. The agricultural communicators across the land grant system have the principle (albeit limited) existing resources to tackle this job.

CURRENT RESEARCH INFORMATION SYSTEM

51. SAES Use of CRIS:

The SAESs all contribute to the CRIS data base and administrators use the system to aggregate resource information at regional and national levels. In the Southern region, we have recently used the CRIS to estimate the contribution of our total research portfolio to sustainable agriculture. We have sorted the CRIS data for our region into the components of our Southern Strategic Research Plan and are using it to seek out opportunities for further cooperation and reduction of unneeded duplication. The CRIS is not totally precise or current, but it provides a useful data base for several critical functions at the regional and national level.

52. Effectiveness of CRIS in Obtaining Information on Research Projects:

Most scientists today have far more effective ways of gaining access to current scientific information. The major use of the system is not to obtain a current picture of individual projects, but to access summary information about interesting aggregates of information. As one option, it might be useful to consider if the CRIS is needed in its present form or whether it might be replaced by the management information system mentioned several times in previous answers. As a minimum, the new system should contain more data on uses and applications. A new system must employ the new technology for information acquisition, storage and retrieval which will eliminate the current constraints imposed by having to retrieve information in a taxonomic format that limits utility for special needs. An option favored by some would be to enhance the utility of CRIS *and* develop the management information system.

53. Management Information System:

As noted throughout this response, there is a vital and urgent need for a management information system that allows for acquisition, storage and retrieval of both scientific and management information. A flexible system, perhaps tied to the world-wide web or similar technology and which meets the needs for both enhanced technology transfer and program advocacy should be mandated by the Congress.

54. CRIS as an Accounting System:

The current CRIS was designed to provide for exchange of scientific information. It does not meet the current needs for GPRA and other accountability demands on the system. Extension has never participated in the CRIS.

INTERNATIONAL RELATIONS

55. Long and Short Term Support of International Agriculture by USDA:

USDA supports domestic research that has secondary benefits to other countries through its broader application. In the era of continuing threats to the USAID programs for international agricultural research, there may be opportunities to expand the USDA role, if funds accompany assignment of mission responsibility.

56. Continued or Expanded Role for USDA in International Agricultural Research, Education, and Extension:

U.S. contributions to the knowledge base for international agriculture have been enormous over the years, with resulting benefits that apply both to U.S. internal interests and to those of the rest of the world. However, the investment in agricultural research and especially its relative contribution to the whole of international agricultural research has declined very substantially in recent years.

As the Committee goes about setting the U.S. agricultural research agenda in the next Farm Bill, it seems clear that budget deficit pressures will dictate that future federal investments are directed to highest priority areas that have clear relevance to national interests. It is our contention that the continuing engagement of U.S. agricultural research in the international arena falls clearly above the threshold for continued support.

Regarding the role of USDA in international agricultural research and extension, it would be our view that new funds would have to accompany any new international mission. If USAID can survive and do reasonably well, and if it embraces the international agricultural mission that is needed, it perhaps would be better for this agency to retain responsibility for these programs. If it becomes clear that USAID and/or its agriculture programs won't survive, then USDA should see if it can salvage critical elements and related funds and administer them.

57. Role of USAID and its Linkage to USDA:

The specific support of international agricultural research has been mostly provided by USAID. In this case, U.S. researchers are supported in conducting research the results of which are applied mainly to developing countries, but which have also had substantial domestic impact. USAID is also a critically important donor to the CGIAR International Agricultural Research Centers, which have provided key collaboration with U.S. scientists in achieving goals of mutual interest. Recently, USAID has suffered substantial reductions in overall funding and the programs in agriculture have been disproportionately reduced. The emphasis has shifted from production to natural resources management.

In addition to the direct benefits to U.S. agriculture that result from international research, it is now accepted broadly that promoting agricultural production in developing countries through research has had, and will continue to have, a major positive impact on U.S. exports by promoting general economic growth which, in turn, creates or expands export markets for the U.S. A substantial part of this growth in exports involves agribusiness products sold as production inputs.

If the threat of further major reductions in the U.S. contribution to international agricultural research actually occurs, two serious consequences will result: (1) there will be a very substantial impact on the efforts of developed countries to provide the knowledge and know-how for developing countries to feed themselves and (2) as a result, there will be serious limitations in the ability of these countries to develop the economic basis to become more active trading partners with the U.S. and other countries.

There is a very large and increasing convergence of the U.S. domestic and international agricultural research agendas. Developing better knowledge and technology to improve the efficiency of production of food and fiber, enhancing environmental stewardship, conserving natural resources and biodiversity, and improving the quality and safety of food are common goals of all countries, albeit with specific orientation to individual geopolitical situations. The commonality of overarching goals, coupled with emergence of modern research methods, which enhance the ability to apply research done in one place to other locations, are contributing to a profound transformation of agricultural research and the emergence of a global research system in which all major countries are increasingly interactive to their mutual benefit.

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October 31, 1995

Dr. John Goldberg
House Agriculture Committee
U.S. House of Representatives
Washington, DC 20515

Dear Dr. Goldberg:

As requested by Representatives Roberts, Allard, de la Garza, and Johnson. The Association of American Veterinary Medical Colleges (AAVMC) has attached its comments to the 57 questions presented to us regarding the Agricultural Research, Education, and Extension survey sent by the House Agriculture Committee in July, 1995.

The AAVMC coordinates the affairs of the 27 US Veterinary Medical Colleges, Departments of Veterinary Science, Departments of Comparative Medicine, and animal medical centers; fostering their teaching, research and service missions nationally and internationally. Addressing the interests of producers and consumers of food and fiber, the interests of animal owners, and pet owners, AAVMC's principal interest is improving the quality of human and animal life. AAVMC continues to address societal concerns about food safety; advance veterinary education; improve animal health and well-being; strengthen biomedical research, and enhance environmental quality.

On behalf of AAVMC, I would like to commend the committee for giving us the chance to provided insight on how limited Federal research money can be better utilized with regards to agricultural research, education, and extension.

If you should have any questions regarding AAVMC's responses to the questions, please do not hesitate to contact Beth Winter, AAVMC Senior Policy Specialist, or myself.

Sincerely yours,

Lester M. Crawford, D.V.M., Ph.D.
Executive Director

LM:bw

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FEDERAL AGRICULTURAL RESEARCH PROGRAM

SURVEY RESPONSE

For the

U.S. HOUSE OF REPRESENTATIVES
COMMITTEE ON AGRICULTURE

October 31, 1995

Submitted By:

THE ASSOCIATION OF AMERICAN
VETERINARY MEDICAL COLLEGES
(AAVMC)

Federal agriculture research goals

1. The Federal government must continue agriculture programs that benefit the production of quality and safe products for producers and consumers.

2. There should be coordination of goal setting activities among all Departments of the Federal government with respect to agricultural research however, the goal setting should not totally drive the agriculture program. In addition, where necessary, agricultural research should be done in coordination with human health research.

3. FAIR '95 was a good process. The National Coordinating (NC) Committees of Research Resource (RR) programs could assume a greater role in coordinating national program activities and priorities.

4. Under the current system the scope of the stakeholders is rather narrow; therefore there is a need to expand the stakeholders to include medical, transportation, and commerce representatives.

5. No. With the agriculture community, the priority setting needs to be done on a more long-term basis, and there needs to be more effective ways of redirecting funding within USDA. In addition more resources need to be committed to competitive funding based on priorities.

6. Yes. The current system does a reasonably good job addressing specific technological and industrial needs, but it lacks adequate support for facilitating technology transfer.

7. Currently there is a good balance between the two.

8. With the decrease in price support, USDA/CSREES needs to direct more funding to agriculture research to insure that this sector of society does not suffer; especially with the signing of NAFTA and GATT, which will open our markets on the international level more widely. While such a move will benefit the country, it may also cause additional problems for producers (i.e. import of new diseases or reemerging diseases). With this in mind, there needs to be a research program for agriculture which would expand the scope of the NRI and its resources.

9. In order to integrate all levels of government to develop high priority regional programs in research, teaching and extension, we need to expand NC Committees of RR Program to more fully accommodate producer and consumer/societal issues. Researchers cannot be the sole dictators of research programs.

10. The Federal agricultural research role is moderately important in supporting other agencies of USDA and outside USDA. Research should continue to be awarded on a competitive basis under the peer-review system.

11. CSREES should serve as the convener for long-range planning on national issues and then function as an advocate of agricultural research. In addition, the Agency would be the distributor of funds and reporter of research results to Congress.

12. Integrated systems within USDA are necessary. As part of that system, extension plays two roles: (1) they are used to identify a problem that would need to be researched; and (2) they would be the mechanism used to transfer the resulting technology.

Advisory Boards

13. Yes. For the first time in decades, through the use of the advisory boards, there is a means of bringing all of agriculture to the table with common themes.

14. Through the Advisory Boards, consumer issues have affected priorities; on the other hand, funding has not developed either for the Boards or for the research. Currently, there are too many boards. During the reauthorization of the 1990 Farm Bill, the existing boards should be combined into one joint board.

15. In order to improve USDA's process for planning and prioritizing agricultural research, Congress should consider following the process used in FAIR '95.

16. Stakeholders must be part of the research priority setting process as well as other Federal agencies. Customers and partners can serve on the same board.

17. If funding is available to utilize the board to its full potential, it could have a very positive impact on international agriculture.

Funding Considerations

18. Federally funded basic and applied agriculture research should be equally split (i.e. 50/50).

19. To improve in the efficiency of agricultural research Congress should assist in implementing CRADA or CRADA-like programs through CSREES for the University community.

20. Funding for multi-year programs can be funded in the future through long-range planning and presentation of HHS/NIH funding philosophy in agriculture.

21. A better mechanism of tracking the funds needs to be established. This would give the agriculture community the tools is needs to better market its success and impact on improving American lives.

22. As for the proper split of funding mechanisms in agricultural research, in-house (state) would serve as the base funding. Federal monies would be divided based on the following: Formula - 60%, Competitive - 30%, and Special Grants - 10%.

23. Specified programs funded through agricultural research mechanisms should be front ended. With a specific blueprint of how the program will be funded through specific timeframe. This will insure completion of the program over a specific period of time.

24. It is critical that the majority of Federal Funds be used for programs (90%); facilities should receive the remaining 10% of the Federal money. The awards should be made on a competitive basis, regionalized research can be effective, because it allows for coordination of research efforts and alleviates overlap.

25. Yes. Given the current funding conditions, there is a need to expand partnerships to secure additional dollars.

26. "Check-off" fees on commodities provide limited resources for research and education. More funding should be directed to research for consumer issues rather than 95% to marketing.

Delivering agricultural research

27. In order to prioritize USDA actions in improving its management of agricultural research, the Department should A) establish more targeted, competitively funded research through grants and RFP's; B) utilize more aggressive marketing of what is done for society; C) encourage CSREES CRADA's through RFP's.

28. In order to improve delivery, results and benefits of Federally funded agricultural research, Congress should increase funding for basic and applied competitively funded programs.

29. It is critical for graduate level training for work forces responsible for the food and fiber need as well as the natural resource concerns of the public. The future decisions should be science based for societal decisions.

Land Grant Universities

30. The University Community is an established structure that allows the Federal Government to form partnerships for agricultural research. In addition, the resources

and expertise for the partnerships are already established to help the Federal government set priorities.

31. Once these priorities have been established formula funds should be disbursed based on them.

32. The agriculture experiment stations could most likely be reduced and handled on a regional basis rather than a state-by-state basis. Responsibilities would also be assigned on a regional basis.

33. In order to coordinate agriculture research among Federal, State and private institutions, USDA would need to conduct national coordinated planning effort involving all stakeholders. Congress would need to be willing to fund the project in order for it to be successful.

34. Regional Research is currently in existence, but it needs to be expanded to be based on issues not on exclusive research projects. In addition, it should be expanded to include stakeholders.

35. In order to avoid unnecessary duplication of Federally funded research programs, it would be appropriate and highly desirable to use Federal funds for the establishment and support of a consortia to address problems/issues.

36. USDA should definitely seek new partnerships outside the Department, but within the Federal government. Natural resource use, Rural Development, animal well-being, and food safety are societal concerns and the federal sector must be involved to help support and develop policy. Additional partnerships could be formed with HHS and EPA as examples.

37. The NSTC has made a modest start to coordinating related research activities across agencies; however there is still too much territiorialists for any real progress to be made.

National Research Initiative

38. The increase in the NRI could be achieved in redirect of 5-10% in all agencies' (ARS, APHIS, FSIS, ES, ERS, CSA, etc) funding for R&D. These same agencies should also help establish priorities for the research to be funded competitively through the NRI.

39. The NRI could also be funded by establishing a trust fund with a tax deduction to businesses that contribute. Then Congress could redirect the subsidy funds like the AIC Institute. A second option would be funding the program through savings made by commodity cuts made during the reconciliation process.

40. The focus of the NRI has been on enhancing existing basic research, not on expanding research. Expansion can not be done until more funding ($500 million) is secured.

Agricultural Research Service (ARS) Laboratories

41. It is important to have some USDA research laboratories, but the number should be reduced and approximately half to three-fourths of the research money support should be from competitive sources such as NRI, special grants, and RFPs. This level of competitive funds currently in ARS-ERS, etc. should be placed in the NRI budget.

42. A) Definitely B) Close and Collaborative C) Both direct efforts to issues D) Through competitive funding.

43. ARS laboratories are not entirely effectively used in performing needed research. Many lack direction, others are very good. With better consensus planning based on National Planning with stakeholders, ARS laboratory functions can be more effectively linked to State Agricultural Experiment Stations.

Extension Service (Extension functions within CSREES)

44. No and yes. Technology and educational base of extension agents is being overwhelmed by scientific, technological and societal issues. Also lack of funds for information transfer is lacking.

45. Yes. Agriculture and urbanization can be important links in addressing problems and challenges confronting urban populations.

46. Same as 45

47. ES should be addressing activities on production agriculture only as it addresses societal issues related to agriculture and environment.

48. ES should not be involved in direct service and basic research programs.

Dissemination of Research Results

49. USDA's dissemination of Federal agricultural research results can be improved with more effective use of demonstration programs. Research achievements must be relayed in a message that relates to consumer's daily lives.

50. CSREES, USDA and universities must develop a marketing plan for agriculture and its science and education programs for the American people together.

51. CRIS has not been a reliable source of information for our organization. This has mainly been due to the different reporting guidelines utilized by each land grant university depending on their individual school structure. Trying to compare information received from the service would be like comparing apples and oranges. Data collection must be more uniform.

52. CRIS must be more use friendly; that format should be in lay-marketing terms, should offer a scientific summary with publications listed. The lay summary should almost be a news release.

53. No. This would lead to more bureaucracy and non-productive expense.

54. Not really. The CRIS system could be greatly improved.

International Relations

55. Identify common issues important to trade, health (food safety, nutrition), and agency policy issues.

56. The areas addressed in 55 are not adequately addressed by USAID. This should not be as political based as USDA.

57. USAID has a role to play, primarily with developing countries and for political purposes. USDA should take the high road and address issues of trade, health, transportation, etc. that are of importance in our interactions with both developed and developing countries.

USAID has moved away from many agricultural programs and, in particular, animal agriculture. Developing countries need R&D; they will become better trade partners if they improve their knowledge of agriculture.

USDA would be better off to seek new funding to address issues with developed and developing countries. USDA/CSREES could continue with USAID on current contractual programs.

1890 COLLEGES AND STATE UNIVERSITIES
PROGRESS THROUGH RESEARCH AND SERVICE

Association of Research Directors, Inc.
OFFICE OF THE CHAIRMAN

October 20, 1995

Dr. John Goldberg
House Agriculture Committee
1301 Longworth House Office Building
Washington, D.C. 20515

Dear Dr. Goldberg:

Please find enclosed responses to the "Agricultural Research, Education and Extension Questions for Discussion" requested by the HR Committee on Agriculture for examination of the Research Title.

We greatly appreciate having the opportunity to respond to these questions.

Sincerely,

Walter A. Hill
Walter A. Hill, Chairman
Association of Research Directors

/sfm

Enclosures

1890 1990

"100 YEARS OF PROGRESS
THROUGH TEACHING,
RESEARCH AND SERVICE"

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Association of Research Directors (1890s)

AGRICULTURAL RESEARCH, EDUCATION & EXTENSION QUESTIONS FOR DISCUSSION

I. Federal Agriculture Research Goals

1. What should be the role of the Federal Government in agricultural research?

The role of the federal government is essential in conducting agricultural research especially related to the national research issues and priorities such as food safety and quality, human nutrition, water and soil quality, new crops and new products, biotechnology (plant and animal), expansion of genetic resources, and biodiversity (plant and animal), precision farming, integrated pest management, sustainable agriculture, waste disposal (farm and municipal), policy issues (import and export of agricultural commodities and products, and regulatory agencies). The federal government should be involved in high risk and high technology research, and must maintain a strong capability of rapidly responding to potential emergencies at home and abroad. The U.S. also must maintain a critical core of scientific expertise at the Federal level engaged in agricultural research to develop technologies to increase production efficiency and profitability for the U.S. farmers. The emphasis of the Federal government in agricultural research should be comparatively greater on pre-technology (basic) research for long term advancements in agricultural productivity and profitability. The lack of the Federal government involvement in agricultural research may result in inadequate attention to the crucial national issues which will, on the long range bases, adversely affect the U.S. economic agricultural productivity and its international standing in agriculture.

2. To what extent should goal setting and goals in agricultural research be cognizant of and coordinated with research activities in the rest of the Federal research sector (HHS, EPA, DOE, etc.)?

The agricultural research goals and activities in the U.S. Department of Agriculture and in the EPA, DOE, and HHS etc. should be considerably coordinated where agricultural research interests overlap. This could be partially accomplished by Internet online facilities by developing an uniform cross listing of the agricultural research activities by these federal agencies which may be followed by specific coordinating efforts to harmonize the research efforts among the various federal agencies. There are already some efforts being made by the NTSC, and OSTP in this regard to inventory all research and development efforts in the Federal government. This is a step in the right direction. This effort, if carried out successfully, will assist in avoiding duplication of research efforts and probably efficient use of reduced resources in the future.

3. Is the process associated with the Food Animal Integrated Research for 1995 (Fair '95) adequate for the development of Federal agriculture research goals? Are there goal identification processes which might better serve to enhance Federal agricultural research other than FAIR '95?

The process associated with the Food Animal Integrated Research for 1995 (FAIR 1995) is very useful for input for the development of federal agriculture research goals but not entirely adequate. Out of the six goals identified by the FAIR 1995, four were generic and do not specifically represent the needs of the animal sector. Some fifty different government, industry, university, professional societies, and other organizations participated in the FAIR 1995 and provided their input in goal setting. A somewhat similar process was used to develop the ESCOP Strategic Plan in 1994. The goal identification process which focusses on specific needs of a sector and includes all other previous visioning outcomes by the stakeholders, may serve to enhance the federal agricultural research other than the FAIR 1995.

4. If the process of Fair '95 were to be used to adopt an agenda for Federal agricultural research, how would the goals identified in Fair '95 and listed below, need to be modified to address the concerns of all research stakeholders?

1) Enhance industy wide responsiveness to consumer and societal concerns;

2) Meet market demands through increased efficiency and competitiveness;
3) Develop integrated food animal management systems;
4) Maintain and enhance environmental quality;
5) Improve food quality control in terms of safety, desirability, and nutritional composition; and
6) Enhance animal well being throughout the life cycle of food-producing animals.

Out of the six goals identified for the FAIR 1995, four were generic and two specific to the animal research program area. The generic goals may be used for another sector e.g. crops but may have to be expanded. A similar visioning process as FAIR 1995 may have to be used for representing all stakeholders in this sector i.e. crops. The inputs from stakeholders need to be used in identifying expanded goals, and especially setting priorities for specific research needs in that sector i.e. crops.

II. Priority Setting

5. Is Federally funded agricultural research focused on the issues of highest priority for producers, processors, and consumers? If not, how can the priority setting mechanism be improved to insure that these issues are addressed?

It is not the mechanism of priority setting but the coordination of priorities which is the problem. Eventually, there should evolve a single strategic planning process for the USDA and its state partners (for federally funded research) for agricultural research. Also, the conflicting issues and interests of the clientele (producers, environmentalists, animal well being groups, anti-biotechnology groups, executive branch of government, and the congress etc.) greatly complicate the priority setting process, and it may become even worse due to future budgetary constraints. There is obvious need for better communication, articulation, and realization of issues to bring about broad consensus, and harmonization of role of the federal agencies including the state partners who are beneficiaries of federal funds.

6. Should Federally funded agricultural research address specific technological and industrial needs? If yes, does the present system fulfill this goal (If not, please describe how this can best be accomplished)?

The federally funded agricultural research programs should address specific technological and industrial needs. There are presently USDA (ARS & CSREES) programs targeted towards such technological and industrial issues. The federal research priorities evolve through inputs from varying stakeholders and, thus, represent the regional and national research issues and industry needs. The industry usually do not venture on high risk and longer range problems. That is one of the roles of the federal government in agricultural research. It is a common knowledge that results of pre-technology research are readily brought into practice when partnering with the industrial sector. The present system does fulfill this goal and there are already avenues available to a greater extent to convert science based technological knowledge to industrial uses. However, increased partnership with commercial sector is needed.

7. Does Federal agricultural research adequately address projects that result in quantum leaps in benefits, or does it dwell too much on incremental benefits?

The quantum leaps result from incremental research benefits. The federal agricultural research adequately addresses this issue. A good example of incremental benefits which resulted in a quantum leap is the dairy industry. During the last 40 years, the milk yield per cow has more than doubled. In addition, the non economic benefits of research should not be overlooked.

8. What is the appropriate role for USDA/REE in insuring competitiveness in the face of decreases in price support programs?

The appropriate role of the USDA/REE in insuring competitiveness in the face of decreases in price support programs is to provide research technology to produce higher yields at reduced costs while sustaining natural resources. There is a need to develop alternative agricultural production systems (sustainable agriculture systems) that optimize the use of natural resources than optimizing the economic returns.

9. How can the appropriate Federal-State-Industry resource pools be integrated to develop high priority regional programs in research, teaching, and extension?

The appropriate federal, state, and industry resource pools can be integrated to develop high priority regional research, teaching and extension programs by involving appropriate federal and state research scientists, university faculties, industry, special interest groups, and the producers at the local level to tackle a distinct agricultural research need. However, there needs to be consensus among all stakeholders on the regional issues for the programs in research, extension, and education to be successful.

10. How important is the Federal agricultural research role in supporting other agencies of USDA? Of other Federal agencies? Could this be done more efficiently and at lower cost?

The support of other USDA agencies is an important role of the federal agricultural research. This is also true of other federal agencies such as EPA, DOE and DOD etc. where agricultural research missions overlap. This could be accomplished more efficiently but not necessarily at a reduced cost. However, reduction of duplicative efforts and better research coordination within USDA, and among other agencies may reduce cost. The last part of the question seems to imply that the federal agricultural research support role can be accomplished at a reduced cost through competitive grant system may not be valid. It is difficult to identify, focus, and resolve issues in a timely manner through competitive grants.

11. USDA reorganization created the Cooperative State Research, Extension, and Education Service (CSREES). In your opinion, how should this newly configured agency function to support the U.S. agricultural enterprise, 1995-2002?

The reorganization of agencies does not necessarily mean better functioning and reduced costs. It is prudent to make adjustments on the bases of what is working and what is not. This newly configured agency should function to support the U.S. agriculture enterprise by working with partners and customers to advance research, extension, and higher education in the food and agricultural sciences and related environmental and human sciences to benefit people, communities, and the nation. There should be comprehensive coordinated programing and goal setting in the agency.

12. What is the proper place for integrated systems programs? What role should the Extension Service (extension functions within CSREES) play in these programs?

The integrated systems programs are very much needed and should be highlighted in the REE programs. The extension service (within CSREES) should play the role of providing leadership in developing science based information to facilitate the acquisition and application of knowledge and skills focussed on agricultural systems. Extension service should also provide a strong role of coordinating technology generated by the Federal and the State sectors and of adoption of integrated systems by the farmers.

III. Advisory Boards

13. Have USDA's research and extension advisory and coordinating boards been effective in planning and prioritizing agricultural research and extension? (Please explain).

The USDA's research and extension advisory and coordinating boards have been less than effective in planning and prioritizing agricultural research and extension. The ideas and suggestions put forth by these boards have been good, but too little and too late. This situation probably would never change because of the lack of sink with planning, prioritizing, and the budget process. Thus, there is a lack of sufficient flexibility in the process to make the boards effective.

14. How have research or extension priorities been changed as a result of the recommendations of advisory boards (please provide examples)? Are there presently too many advisory boards?

The research and extension priorities have not been really changed as a result of the recommendations of advisory boards. The role of the advisory boards have been limited. There is a room to integrate functions of some of the advisory boards.

15. What options should Congress consider to improve USDA's process for planning and prioritizing agricultural research (i.e. how should the research agenda be prioritized)?

Congress should consider enhancing the formula funded programs such as Hatch & Evans-Allen, and place less emphasis on competitive grants. This would give the research system a sustained and more flexible opportunity to make shifts in priorities without negatively impacting research capability and the capacity of the system to respond to national emergencies.

Some of the other options which congress should consider in prioritizing research are as follows. (1) Make agriculture research title of the Farm Bill to be a permanent legislation separate from the Farm Bill for long term comprehensive research planning and better research outcomes, and (2) Keep in view that the return on each dollar invested in agricultural research is more than 20X.

16. What role should stakeholder advisory boards play in setting the agenda? What groupings should be represented on advisory boards? Can "customers" and "partners" be accommodated on one board or will it require two?

The stakeholders should play an important role in setting the research agenda. The following groups should be represented on advisory boards: producers, commodity groups, processors, consumers, research scientists, educators, environmentalist and conservation groups, industry, commercial and export enterprises. The state partners should also part of the advisory boards. The "customers" and "partners" should be accommodated on the same board for close interaction and understanding among the various groups. The advisory boards should not be perfunctory. The major role of the advisory boards should be to provide critical visionary input that results in developing sound mission for the program area.

IV. Funding Considerations

17. Is there a special role for advisory boards to play in international agriculture beyond what has occurred in the past?

The national boards across the board has not served their purpose. On the other hand, the local advisory groups have been very useful. It appears that the emphasis of the national advisory boards for international agriculture is misplaced. Currently, the emphasis is on U.S. technology transfer to foreign countries through cooperative technical programs; whereas the emphasis should be on the cooperative research which will bring about technology development both in the host country and the U.S., and marketing opportunities for the U.S. value added products. The cooperation should not be merely on science programs. Most of the world population lives outside the U.S.A. and majority of the agricultural research is conducted outside the U.S.A. These facts should be of importance and beneficial to us.

The national boards should be comprised of members who are knowledgeable about the importance of foreign countries to the U.S., know their culture, may be their language, their development and commercialization interests, and genuine interest in the well being of populations beyond boundaries.

18. What is the most appropriate mix of Federally funded basic and applied agricultural research?

The federally funded research should be primarily basic. The appropriate mix of federally funded basic and applied research may be 80% 20%. The basic research is the foundation for long term advancements in agricultural productivity and quality. The commercial and state sectors are interested in short term research issues and priorities, and will not invest in basic research. However, whether the research is basic or applied it should be targeted towards seeking solutions to the pressing present and future agricultural problems. It is critical that the federal research agencies and the state partners maintain a cadre of well trained scientists and interdisciplinary teams, state of the art equipment and facilities and should be able to respond adequately to the present and future research needs.

19. How, if at all, can the effectiveness and efficiency of agricultural research be enhanced at current funding levels? At reduced funding levels?

The effectiveness and efficiency of federal research at the current funding level can be enhanced by reducing duplicative research and facilities, illiminating unproductive, non-innovative old programs, consolidating research in the same area at one location, use of simulations and modeling in areas where enough reliable data exists rather than actual research.

The effectiveness and efficiency of agricultural research at the reduced funding level may not be feasible unless there is a single strategic planning process for agricultural research among all federal agencies and state partners (for federally funded research). In addition, a mechanism similar to the commodity check offs may be needed among state, private and commercial sectors to supplement research funds for national issues. Also, all sectors should be partners in mutually beneficial national issues such as up-to-date and reliable information management systems. The upgrading of CRIS may cost up to $10 million. It will be hard to find these funds solely through federal resources. Since this system is useful and is needed by the federal, state, and industry etc., all sectors should contribute.

20. How can future funding be determined and justified so as to permit multi-year program to be completed?

It is a well established fact that the cost of doing research increases each year. Therefore, funding patterns for multi-year projects should first adjust for the increased cost and then allocate sufficient dollars to the Base (Formula Funded) programs to permit new research to come on stream.

In addition, the duration of most of the research projects is five years. These projects are often renewed with minor changes. However, breeding (plant and animal require much longer period to complete). Thus, there are difficulties in completing long term projects when funding is reduced. Some flexibility in research management and reallocation of allotted funds may assist in completing multi year programs

21. In view of the growing emphasis on greater accountability of Federal expenditures, do you have any suggestions as to how agricultural research results can be measured and their impact evaluated? Is there some standard of accountability for the efficient and effective use of Federal research funds?

The Government Performance and Results Act (GPRA) provides the guidance needed to achieve greater accountability of federal expenditures through strategic planning, performance measures, and evaluation of programs. This process is now being discussed and planned in the USDA and will be implemented soon. It will require changes in reporting of research findings and information management systems. The development of this process is expected to provide standards of accountability which are lacking now, to measure effectiveness and impacts of research for efficient use of federal research resources. It is crucial that the research scientists and research administrators realize that for GPRA to be effective and meaningful the research objectives proposed in the future are outcome oriented.

22. What is the proper balance between in-house, formula funds, competitive grants, and special grants?

The present funding for the in-house, formulae funds, competitive grants, and special grants in the USDA is approximately 65%, 20%, 10%, and 5%. This distribution apparently has served the system well for fulfilling the long term and short range goals for sustained agricultural productivity. The formulae funding has proven to be comparatively more productive as compared with the competitive grants. Therefore, the adjustments in the in- house, formulae funds, competitive grants, and special grants to 60%, 30%, 5%, and 5%, respectively can be justified.

23. What guidelines should be used in determining appropriations for "specified programs" in research, education, and extension?

Guidelines should consist of a combination of requirements for food security, human resource development, and rural development. Each of these components should be a factor in formula funding. This will provide consistency of funding for long term mission oriented programs.

24. Should Federal funds be used for programs only, or for facilities as well? If for facilities, how should they be allotted - competitive proposals or other? Is there a place for regionalizing research, increasing competitive grants, etc.?

Federal funds should be used for both programs and facilities. The state-of-the-art facilities are needed to carry out quality research programs. The allocation of funds for facilities should be both competitive (non-site specific research), and non-competitive (site specific) depending upon the nature of the research. The regionalization of research is also needed. All states (federal funding) should not be doing all things and should prioritize. The reorganization of research is appropriate, however, increasing competitive funding may not increase productivity. Could we have sent man to the moon or built atomic bomb with competitive grants?

25. Is there a place for partnerships not only with state and local public sector organizations and industry; but also with private foundations?

Yes, there is a need for partnerships not only with state and local sector organizations and industry, but also with the private foundations. The private foundations such as Kellogg Foundation, American Farm Land Trust, and Henry A. Wallace Institute for Alternative Agriculture etc. should be involved.

26. To what extent do self-addressed "check-off" fees on commodities provide resources for research and education? Do these/should these programs support long-term research, as opposed to short-term product development and promotion research?

The "check off" fees provide limited but important resources for research and education. These funds should be used for research rather than for promotion. The scarcity of funding in the future may dictate increased use of these funds for basic research.

V. Delivering Agricultural Research

27. In order of priority, what would be the most significant actions USDA could take to improve its management and/or delivery of agricultural research?

The most significant actions USDA could take to improve its management and/or delivery of agricultural research are as follows:

1. Develop single strategic research plan for the USDA and its partners (for federally funded research) with clear and outcome oriented objectives. This includes other federal departments where the agricultural research overlap.
2. Define clearly roles and purposes of in-house, formulae, competitive grants, and special grants.
3. Streamline the USDA agricultural research programs using a visionary planning process for the future agricultural research needs nationally and internationally.
4. Seek legislative support for flexible use of appropriated funds to respond to the most important research priorities and issues when needed.

5 Develop a mechanism that the results of appropriate pre-technology research are commercialized at a rapid pace

6 Streamline extension delivery system including state partners (for federally funded programs), abandon outdated information dissemination methods

7 Establish on-line science based information for dissemination

28. What options should Congress consider to improve the delivery, results, and benefits of Federally funded agricultural research?

The Congress should consider the following to improve the delivery, results, and benefits of federally funded agricultural research Provide flexibility in use of appropriated funds and allow reassignments of funds to important priorities and issues

29. What should be the Federal role in insuring training of future work forces for the food and fiber needs as well as the natural resource concerns of the public?

The federal role should be to support programs to develop human resources such as

1 Developing new initiatives to recruit and train undergraduate and graduate student for research careers in the food and agricultural sciences

2 Develop joint efforts with academic and extension programs to develop minority expertise in the food and agricultural sciences

3. Develop new and innovative ways to provide financial assistance to undergraduate and graduate students preparing for careers in the food and agricultural sciences.

4. Encourage and support leadership development activities among students and professionals to strengthen research programs in the food and agricultural sciences.

VI. Land-Grant Universities

30. What is the continuing role of Land-Grant Universities? 1890's Colleges? 1994 Colleges?

The 1890 Land-Grant Colleges and Universities are valuable resources for educational needs of the nation. These institutions have provided a major means of access to higher education for the Black people in this country over a century. These seventeen institutions presently continue to improve the quality of life and well being of the millions of Americans through their programs in teaching, research and extension. They are of crucial importance for training of minority students, and assistance to low income farmers and rural communities. These institutions are open to all people regardless of race, sex, or socio-economic status, and have produced black leaders in the food and agricultural sciences who are of valuable service to their communities and the nation. There is still a pressing need to involve and encourage minority youth to continue their higher education and become productive citizens. It is the commitment of the 1890 Land Grant Universities and Colleges which provides encouragement and assistance to the minority youth, disadvantage farmers, and low income rural families. Without the commitment and concern of these institutions, the needed support and encouragement for these underserved populations may vanish.

31. Is the current formula used allocating Federal funds to land-grant universities fair, reasonable, and does it address changing conditions? If not, how could it be improved?

The current formula for allocating federal funds to LGUs is both fair and reasonable. However, it does not address changing conditions. Consequently, the formula can be improved by using the current level of allotment(s) as a base for each university and then add to the base a factor which would reflect the ratio of the volume (dollar value) of agricultural sales or its equivalent.

32. The land-grant universities have a system of agricultural experiment stations in each state. In today's environment of Federal and State Fiscal constraints, is such an extensive system of research stations still warranted (please explain)? Could certain functions be merged with other USDA agencies, other Federal agencies, etc.?

The system of agricultural research stations is still needed. However, the utility of some stations should be examined. The U.S. Agriculture Research is primarily conducted by (1) SAES, (2) ARS, and (3) Private-Industry. The Land-Grant system is important in providing education, basic research and local research needs. However, the strength of land-grant system is weakening due to decreased funding (state and formulae funding), dependence upon grants (guided by grantor needs) and income generating projects which totally neglect real local research needs. Consequently, the capacity of land-grant institutions to develop strong research programs have significantly diminished. The LGUs need to reconsider their priorities based upon their individual state needs and strengths. Every university should not strive to excel in everything when the state and federal research resources are becoming scarce. At the same time, LGUs must maintain strong graduate research programs, the foundation of agricultural research system. The USDA role is to conduct pre-technology research, of national importance. The private industry primarily focuses on research which is highly profitable. The SAES are crucial federal partners for long term mission oriented research of national, regional, and local importance. This partnership must be maintained for increased national agricultural productivity.

33. How can agriculture research be best coordinated among Federal, State and private institutions?

The newly reorganized CSREES should serve to coordinate agricultural research among the Federal, State, and Private Industries

34. What models currently exist, and are in use to provide regional cooperation in research and extension?

The existing models to provide cooperation in research are (1) CSREES sponsored regional research, co-location of federal and state scientists and facilities, and the national initiatives involving multi agency coordination (examples Water Quality, Global Environment Change, Food Safety etc.)
The industry and public participation are essentially missing in the existing models

35. In the current era of constrained resources, is it appropriate to use Federal funds to promote cooperative regional research to reduce unnecessary duplication; and to what extent is it appropriate to use Federal funds to encourage consortia of states to establish individual centers of excellence to address common problems?

In the current situation of constrained funding, it is appropriate to use federal funds to promote cooperative regional research to reduce unnecessary duplication, and also to use federal funds to encourage consortia of states to establish individual centers of excellence to address common problems. This can be accomplished through consolidation of related research areas which are dispersed all over the country to form a national or regional research facility. The consolidation of such facilities will provide considerable savings. However, cooperative regional projects require a strong commitment among research partners and other stake holders to be successful.

36. As societal concerns about natural resource use, rural development, animal well being, etc. are integrated into the USDA agenda, is there a role for "new" partnerships with the Federal sector?

There is a significant role for "new" partnerships with the federal sector. The conservationists, environmentalists, societal issues advocates, animal well being society etc. should be part of the USDA agenda. In the past, we have mostly focussed on the production agriculture for setting research priorities but now we must involve other groups with varied interests.

37. Other parts of the Federal Government sponsor research directly applicable to the food and agriculture system. The National Science and Technology Council is intended to address the coordination of related activities across agencies. How is this intended to work in the case of research and extension on food and agriculture? How well is it actually working? Are alternative methods needed?

The NSTC is attempting to inventory research activities among all federal agencies to develop strategic plans for relevant research areas which overlap multiple agencies. This will bring about greater awareness of related programs in various federal agencies and reduce duplication of programs and better coordination and collaboration of needed programs. However, some think that the potential benefits of such strategic planning have been compromised due to budget and staff reductions. The USDA funding is approximately 2% of the total federal budget for research and development and it is overshadowed by the national interest in defense, and medicine etc. In view of importance of food and agriculture to the U.S. and the world, the funding for agricultural research is far short of other areas of research and agencies and should be increased at a rate of 10% per year for the next seven years. This will enable U.S. to maintain global competitiveness, national security, and overall health and well being of U.S. publics.

VII. National Research Initiative

38. Congress authorized the National Research Initiative (NRI) Competitive Grants Program at $500 million per year. If the NRI is to be fully funded, where in the USDA research budget could money be transferred from?

If the NRI is to be fully funded, the money should not be transferred from the USDA research budget. The advantage of NRI may be that it redirects interests of scientists to agricultural research at the LGUs but the competitive grants approach has been proven to be less effective than the formulae funding. It may be prudent to increase the formulae funding for more effective and efficient use of funds.

39. What other options for funding the NRI should Congress consider?

The other options for funding the NRI Congress should consider are the research budgets of DOE, EPA, NSF, and DOD etc.

40. Have NRI appropriations been used to expand agricultural research or have they been used to continue existing programs?

The NRI appropriations have been used both to expand agricultural research and continue existing programs. It has provided funds for basic interdisciplinary research and helped support and expand agricultural research in federal and state sectors.

VIII. Agricultural Research Service (ARS) Laboratories

41. Should the USDA have research laboratories or should it provide competitive funding to existing entities such as universities?

The USDA should have research laboratories for focused research on national issues and priorities. The long term national issues will be overshadowed by domination of local politics and interests by providing competitive funds at the state levels. This in fact defeats the federal role in agricultural research (see response to question number 1). The LGUs are immensely important in providing higher education and research in agriculture, and to maintain scientific expertise to seek solutions to agricultural issues on a continuing basis. The competitive funding can fulfil a role of supplementing base agricultural research programs by supporting short-term research needs and new science ventures at the state academic institutions.

42. Should more ARS laboratories be co-located at land-grant universities? What should be the relationship between ARS and land-grant university scientists? Between ARS research coordination? How can ARS laboratory functions be more effectively linked to State Agricultural Experiment Stations?

The majority of the research conducted by the ARS in plant sciences is carried out at the LGUs campuses, whereas research in the areas of animal sciences, soil sciences and human nutrition etc. is conducted in separate federal facilities. Some of the ARS plant science units should be located at the 1890 Institutions depending upon specific programs such as alternative crops etc. At present there is no presence of ARS scientists at the 1890 Institutions except at Tennessee State University. The ARS research laboratories should also be co-located at the 1890 Institutions in the future in areas where true collaborative relationships may be developed such as biotechnology and human nutrition, etc. and as a result benefiting both the ARS and the 1890 Institutions.

43. Are ARS laboratory facilities effectively used in performing needed research? If not, please explain and offer suggestions for better use?

The ARS laboratory facilities are effectively used in performing needed research for which these were designed in majority of the cases. However, some of the facilities and equipment are very old and have become outdated for quality research. These facilities should be upgraded or merged with other federal laboratories in the same area or co-located at the 1890 Institutions wherever is appropriate. There should be a continued improvement in facilities and equipment to conduct quality research to provide solutions to the national agricultural problems.

IX. Extension Service (Extension functions within CSREES)

44. The USDA Extension Service's (ES) mission is, among other things, to disseminate research results to farmers and other customers. In your opinion, is the ES effective in carrying out this mission? (please explain).

The ES is providing farmers information and assistance in emergencies. However, ES does not control some 75 or so independent land-grant stations. Most of the policy decisions are made at the State levels and the federal extension serves limited role. It appears that the primary function of the ES is to pass through federal funds. The ES needs to streamline its activities to be more effective in dissemination of research results. The ES does not seem to keep pace with the fast moving technology and dissemination of information through the media and Internet.

45. Should the ES be involved in addressing the problems and challenges confronting urban populations?

The ES at the state level should be involved in addressing the problems and challenges confronting urban populations. Historical experiences of ES are a valuable tool to assist in the resolution of urban problems. This does not mean that ES has to become a social service organization in order to assist people. However, the ES at the federal level should concentrate on helping rural people. The ES has neither resources nor expertise to address urban problems.

46. What if any role should ES play in dealing with the social issues facing farmers and rural communities?

The ES should actively deal with social issues facing rural people and communities. It should help rural communities to find ways to survive economically.

It should become more proactive in working with the problem of drugs and alcohol abuse in rural America as well as family violence. It is clear that Urban America may have a greater problem with drug abuse but the rural America has greater problems with alcohol abuse. ES can and should play a role in the social issues facing farmers in rural communities.

47. Should the ES's mission statement be changed to focus activities on production agriculture?

The ES's mission statement should include providing education and information on production agriculture in a healthy rural environment.

48. What should ES not be involved in?

ES should not be involved in issues such as food stamps, alimony, and on monitoring child care payments etc. These are strictly social agency type problems. ES should restrict activities to dissemination of information about agricultural research findings, and should have limited role in conducting research.

X. Dissemination of research results

49. Do you have any suggestions on how USDA's dissemination of Federal agricultural research results can be improved?

The USDA's dissemination of federal agricultural results can be improved by establishing linkages between federal (all federal agencies such as DOE, EPA etc.), and state groups (state extension, state economic development programs etc.) for technology transfer on routine and timely basis. An Internet data base for all agricultural research results should be established for producers and other users. The prediction models and other outcome based information should be available on line for various production practices.

50. Who is, or will be, responsible for developing a marketing plan for agriculture and its science and education programs to the American people?

Ultimately, the Secretary of Agriculture will be responsible for developing a marketing plan for agriculture and its science and education programs to the American people.

XI. Current Research Information System (CRIS)

51. ARS uses CRIS to provide information about USDA research projects. How, if at all, do you use CRIS?

The CRIS is used to retrieve information regarding the research programs of USDA, SAES organizations, Forestry Schools, 1890 Institutions, and other cooperators. The information is needed to prevent duplication of research, learn about other researchers who are working in a similar field; and the system to assist in answering questions from local legislatures. In addition, the financial information contained within CRIS is used to plan programs and budgets, trace resources in specialized research areas, and to answer legislative questions. The USDA provides information to CRIS on timely bases but the state system is extremely slow in providing data on their research projects. The necessary measures are needed to encourage the state partners to provide information in a timely manner.

52. In your opinion, is CRIS effective in helping you obtain information on Federal agricultural research projects? If not, what changes are needed to this information system that would provide quality data on Federal and State agricultural research? (Please explain).

Yes, CRIS is effective in providing a mechanism to obtain information on federal and state agricultural research projects. CRIS could be improved, with additional funding, to take advantage of the new technology that is currently available. On-line access to the financial information contained in the database would be most useful. In addition, CRIS technical information on the INTERNET, with a software package that would allow identification of numerous characteristics in the data would be desirable.

53. Is there/should there be an appropriate and adequate management information system(s) in place to report and collate results from Federal investments in research, extension, and higher education sponsored by the USDA (and related research agencies?

Yes, there should be a management information system in place to report results from Federal investments in research, extension, and higher education programs. CRIS can be modified to contain a "Results Report." Extension and higher education programs need a system similar to CRIS in order to report results information. Each of the research areas mentioned are separate and have differing needs, therefore, separate systems should be designed which will fulfill the specific needs of the program area. These systems should have a similar interface so that the same retrieval logic could be executed against the differing databases. Currently, there is no comprehensive system in place across the federal sector that documents all agricultural and related program research, extension, and higher education activities. The CRIS system reports the state and USDA in-house research programs on research that is funded totally or partially with USDA funds in the land-grant system. Extension and higher education activities are not documented in a central database at the national level. Also agriculture and food science activities supported by other federal agencies such as NSF, EPA, and NIH are not reported in CRIS.

54. Does the CRIS system and other USDA reporting systems provide an adequate accounting of the research and extension work that is being done in America?

The CRIS system provide an adequate accounting of the research work that is being performed. Extension, on the other hand, does not have a system similar to CRIS, therefore, Extension does not have an adequate accounting of the work effort that is being carried out throughout the country. The CRIS does a good job for what it was designed decades ago. However, the CRIS needs to be updated to an appropriate management information system to meet the complex information needs of the present times.

XII. International Relations

55. How can the USDA be most effective in the short and long term through its support of international activities?

The USDA can be most effective in the short term through its support of the International activities to carefully determine and review the emerging technologies in the foreign countries and see if those could be combined with our own commercialization at home as well as abroad. In the long term, the USDA should develop collaborative arrangements with well known foreign agricultural scientists in order to develop technologies which will be useful for the foreign countries as well as the U.S.

56. Currently, USAID and other programs extend agriculture and agricultural development beyond the nation's borders. What continued or expanded role should USDA play in international research, education, and extension.

The USDA should play a continued and expanded role in international research, education and extension. The majority of the agricultural research takes place in foreign countries. During the past 30 years there has been significant improvement in the quality and the quantity of research being conducted in the foreign countries. The USDA should develop collaborative research efforts with the foreign countries for mutual benefits.

57. What is the role of USAID in funding agricultural research and extension? Has USAID maintained support for agriculture or has the agency moved away from agriculturally related programs? What is the role of long-term agriculture R&D in developing countries in new markets for U.S. products? Should USAID contract through USDA/REE for long-term agriculture R&D?

The primary role of the USAID in funding agricultural research and extension has been to provide self sufficiency of food in developing countries The USAID has not maintained support for agriculture and in fact has moved away from agriculture The presently proposed USAID program to South Africa, does not have any funds for agricultural programs The long term agriculture R&D role in developing countries should be not only self sufficiency but also to enhance rural economic development by increasing farm income   The economic development may be brought about through alternative crops, and high value food and non food products The enhanced economic capacity of developing countries will also create a demand for U S products The USAID should contract through LGUs for long term agriculture R&D

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November 22, 1995

Dr. John Goldberg
Committee on Agriculture
U.S. House of Representatives
Room 1301, Longworth House Office Building
Washington, DC 20515-6001

Dear Dr. Goldberg:

Attached is a response to the 57 questions posed by the House Agriculture Committee relative to the future investment in agricultural research and the role of USDA in agricultural research programs. Thank you for the opportunity to respond to these questions on behalf of the Board on Human Sciences of NASULGC. Thank you also for a reprieve in your stated deadline.

A hard copy of this report is being mailed to you under separate cover along with a copy of a report referenced in my response to question 4.

I would be pleased to discuss any of these responses in further detail if the committee would find it useful. The Board on Human Sciences is keenly interested in the nature of the 1995 Farm Bill, particularly the research and education titles. Please express our sincere appreciation to Chairman, Pat Roberts; Ranking Member, Kika de la Garza; Subcommittee Chair, Wayne Allard; and Tim Johnson, Subcommittee Ranking Member for the opportunity to participate in this discussion.

Sincerely yours,

Barbara S Stowe

Barbara S. Stowe
Dean

AGRICULTURAL, RESEARCH, EDUCATION, AND EXTENSION RESPONSE TO DISCUSSION QUESTIONS

Barbara S. Stowe
Board on Human Sciences, NASULGC

Federal Agricultural Research Goals

1. The role of the federal government in agricultural research should be to:

   - Support fundamental research which transcends regional boundaries.
     - Examples include: mapping of the plant and animal genomes toward the goals of producing high-quality/low-cost, reliable sources of food and fiber; the biochemistry of nutrition in relation to disease toward the goal of creating a healthier population.
   - Guide the agricultural research agenda toward major transitions; i.e. from increases in production to studies of the impact of production methods on the global environment and on the quality of life of those who are engaged in agricultural industries, and the economy.
   - Support research which anticipates the impact of major transitions in agricultural production and processing on the availability of natural resources such as water, land, and populations.
   - Partner with the land-grant universities in conducting agricultural research to:
     - Utilize the expertise and laboratories across the country.
     - Address regionally specific aspects of universal research problems.
   - Educate the next generations of agricultural, environmental and human scientists.
   - Coordinate the research among federal agencies which bear upon agriculture and related enterprises. Duplication is not affordable but collaboration can be very cost effective.
   - Provide enough flexibility in the research mission to foster creativity and new avenues of inquiry.

2. (See response to #1).

3. FAIR '95 is conceptually a good approach to agricultural research, but it is too narrow in scope. Linking science and technology to societal benefits is a worthy approach to agricultural research at the federal and state levels. FAIR '95, however, focuses only on animal science. Agricultural research must include plant sciences, environmental sciences, and human sciences; people being both the managers and the consumers of agriculture. U.S. agricultural research, to this time, has supported much more vigorously the production of the food and fiber supply than it has the consumption and benefits of the research product. Efficient, effective agricultural research in the next century must be more holistic. Agricultural science should be viewed as a means to an end, rather than an end itself. For example, productive, scientifically-based agriculture research feeds people, provides fiber for clothing, buildings, and a whole range of items which support commerce. But agricultural practices either sustain the environment or ruin it. Agricultural practices enhance or deplete whole communities. Agricultural science can support nutrition research for health maintenance or if not, see the alternative of more resources deferred to health care.

   Leaders of the House and Senate Agricultural Committees encouraged a national workshop entitled, "Food Systems for Consumer Health", (document attached) which emphasizes the importance of integrating aspects of agricultural research toward the goal of improved consumer health. Federally supported research, in conjunction with the land-grant university system, has in place an excellent mechanism for integrated research programs which link fundamental genetics of plant and animal sources to the nutritional needs of the population.

Priority Setting

5. It is my view that federally-funded agricultural research is focused more heavily on production than on processing and consumption. The composition of advisory bodies should reflect changing needs for agricultural priority setting and research programs. This would suggest that some seats on advisory boards that have currently been occupied by commodity group representatives, consumer advocacy groups, and deans of agriculture would be replaced by processors of agricultural products, representatives from other federal research agencies, deans of human sciences in the land-grant university system as well as deans of engineering, veterinary medicine, and natural resources.

6. Much of the research enterprise in support of agriculture involves application of fundamental research concepts to improvements in agricultural products and processes. In that context, the federal government has had responsibility for coordinating technology transfer, but without supporting special interests. The productive research agenda must have a feedback loop. Supportable lines of inquiry arise from knowledge of what works, and what does not in order to determine what questions still need to be addressed.

7. There are not many quantum leaps in any research program. Quality research findings must be verified and their value exploited in application. The federal research agenda must be dynamic, dropping lines of inquiry when new problems or issues arise. We are long past the time of simply adding on new priorities without dropping others. For example, if the federal research agenda were directed toward studying the impact of agricultural production methods on the environment and society, that would reorder and redefine the research agenda.

8. A proposal has been developed which would shift dollars saved from price support programs to agricultural research and education programs. Dollars saved from this action, might well be directed toward alternative uses of land and alternative crops toward the goal of mitigating major disruptions in the economy of the country and particularly the families and communities engaged in agriculture.

9. The systems are essentially in place. Through CSREES and the NASULGC partners, collaboration of research, teaching, and extension can be integrated. For the collaboration to be successful, each entity involved must be at the table for planning and priority setting for research, extension, and resident instruction programs. With the advent of telecommunications, these collaborations can continue to be very effective and at reduced costs for time and travel.

10. USDA has undergone major reorganization. CSREES (and to a certain extent other units of REE) have a relationship to the land-grant university system which is quite unlike that of other federal agencies. CSREES should play a brokering role with other federal agencies where expertise and talent within the land-grant system could benefit the research and education agendas of other federal agencies.

11. CSREES now embodies the land-grant mission of discovery, dissemination, and education of the next generation of professionals within one integrated agency. The functions are linked in a dynamic manner, that is the results of discovery inform dissemination at various levels (individual, family, industry, policy maker). Research and extension programs are the laboratories for the next generation of professionals. Students in land-grant universities learn to be researchers and educators by solving the real problems of clientele, and in turn the real problems also drive the research and education agendas. CSREES must retain a limited array of subject matter faculty, that is nutritionists, food scientists, animal, plant and environmental scientists, etc. In addition, the agency must have process specialists; evaluation and assessment specialists, communications technicians and marketers, higher education specialists, and an

administrative staff which can get the agency to work as a team, represent the agency as a broker to other agencies, as a representative to Congress, state, local, and international governments, and to the public at large.

12. N/A

Advisory Boards

13.-15. Yes, in my view the USDA Advisory Boards have been effective. They have provided a more holistic perspective for the agricultural research, extension, and education agendas. The Boards generally have gone from producing a longer list of priority areas to identifying four or five key issues which should receive the attention of the research and education system. Not only have these advisory boards recognized the importance of pursuing new and improved methods of agricultural production, but have also focused on the impact of production methods on people and communities, i.e., rural America. To my knowledge there are currently three major advisory boards; Users' Advisory Board, Joint Council on Food and Agriculture, and the Agricultural Science and Technology Review Board. That is probably too many, but if the number is reduced to one or two, the representation and functions should be maintained. Advisory boards should be just that, identifiers of priority issues, but not those who set the agenda. The membership should have staggered terms, none to exceed three years in length.

16. Composition of the advisory board(s) should include:

- Those who conduct the work (researchers, educators, extension professionals).
- Those who use and disseminate the results (corporate sector which utilizes USDA research and information, clientele, and citizens) including local government representatives and volunteers.

Clientele must be broadened to include more than corporate farmers and ranchers, such as family farm operators, product developers, rural development specialists, natural resource managers, importers/exporters. If USDA and Congress are to be advised on priorities for research and education, they must get past the notion that it is only farmers and ranchers which represent agricultural interests.

Customers and partners must be on the same board. It is the varying points of view and recommendations for resolution of differences which marks the value of advisory boards.

Any configuration of advisory boards must have an efficient executive director and small staff to maintain them.

17. The whole agricultural enterprise will become increasingly international and consequently that element must be an integral element of advisory board composition. That element has had very little visibility in the discussions and reports of the current advisory boards.

Funding Considerations

18. The appropriate mix of federally funded basic and applied agricultural research is difficult to estimate without an understood definition of each. Most agricultural research is an application of fundamental research fundings. Genome mapping is applied to plant and animal resources for food and fiber, biochemistry is applied to understanding the interaction of nutrient and body metabolism, computer modeling is applied to projections of community vitality or to expert farming systems. Each of these examples is fundamental to the agricultural enterprise but is also an application. Research payoffs are from a continuum of basic to applied studies.

19. The effectiveness and efficiency of agricultural research at current funding levels can be increased by:

- Enhancing the peer review competitive grants approach to research funding. The approach helps to focus the federal research agenda as well as provide some flexibility in moving funds toward higher priority research areas. However, this approach can only be efficient, if the application for grants and review processes are simplified, otherwise the researchers spend too much time and energy in seeking funds rather than carrying out the work.
- Enhance research partnerships: interagency partnerships at the federal level (NSF, NIH, HHS, etc. with USDA).
- Enhance state and federal partnerships
- Enhance federal, state, and private sector collaborations.

20. An annual appropriation process to effectively support multi-year programs must provide flexibility for the research managers. Base funding is critical to this process. Research directors must have access to funding which will support the infrastructure (personnel, equipment, space) to initiate new lines of inquiry which subsequently may qualify for competitive funding and for leveraging collaborations with other agencies or the private sector. Multi-sources of funding can provide the research director flexibility to manage multi-year programs from an annual appropriation mode. Obviously, carryover with accountability must be permitted. Accountability for federal expenditures can be enhanced by building evaluation components into the request for proposals for competitive grants. However, it must be made clear to the grantee what will constitute acceptable measurement of results including both long-range and short-term impacts. For example, if the research is to change an agricultural practice or invoke behavior change in individuals or a population, then how many must adopt the new practice or what dollar benefit would be considered acceptable? Basic research may be evaluated over a longer term by the nature and number of applications to problem solving. Research is discovery, there are bound to be dead ends. Accountability must make allowance for those as well.

22.-23. The specific balance among multi-sources of research funding is difficult to specify. Formula funds are essential to the maintenance of the research infrastructure (faculty and students, laboratories, and equipment). Formula funds provide the seed dollars to pilot new initiatives, leverage state and private funding sources, and educate the next generation of scientists. Competitive grants help to assure that the best scientists are developing new lines of inquiry and following them to productivity. Competitive grant funding derives from a set of research priorities which can be communicated to the funding source. The competitive grant process must be simplified to the point that researchers will not be spending more time seeking funding than actually conducting the work. Special grants may be a way for a federal agency to launch a new research initiative. It can help the federal agency use the expertise in the state universities or elsewhere to launch the initiative. Special grants in response to political favors are not appropriate in a astringent resource environment.

24. Federal funds should be used primarily for programs, however infrastructure to support those programs (particularly new lines of inquiry) are justified. Appropriate infrastructure is essential for the conduct of quality research in a competitive global environment. Research is dynamic, thus research infrastructure may have a short half-life. Researchers must have access to rapidly changing technology if they are able to conduct cutting edge work. Federal dollars directed toward infrastructure should require leveraging of state and or private funds.

Research through CSREES of USDA is already regionalized and that should be encouraged to continue. Regionalization however may not simply be geographic but should include the notion of collaboration among researchers and laboratories working on similar problems, regardless of where located.

25. Partnerships with private foundations may be productive, providing the foundations are not limited to a viewpoint.

26. Self assessed check off fees on commodities provide a viable source for research and education. They provide the advantage of engaging the producer (provider of funds) in understanding the actual costs of conducting research as well as interest in the outcomes. Check-off funds are more appropriately applied to short-term product development, but should not be limited from supporting more fundamental research. This source of funding is particularly useful for exploring alternative uses of agricultural products.

Delivering Agricultural Research

Priorities for improving the management and/or delivery of agricultural research:

- Enhance support for CSREES and assure a quality management team in that agency. Unique to this agency is the partnership in science and education with land-grant universities throughout the nation. The partnership assures a large pool of qualified researchers who can study issues which are culturally or climate specific, which is also educating the next generation of agricultural researchers, and which is linked directly to a public dissemination system, the extension service.
- Change the paradigm for agricultural research funding from commodity production to one of benefitting the health, well-being, economy of the nation in an environmentally sensitive manner. Food and fiber production must be viewed more broadly, from impacts on people and environment as well as on the farmers and ranchers who produce the raw product.
- View agricultural research within the total research agenda to determine how scarce funds can be enhanced by collaborations across agencies to solve agricultural research problems.

28. Enhance the land-grant notion of a dynamic system of research, education, and extension. It is important to emphasize that the land-grant idea is an organizational structure not a subject matter (i.e., agricultural production) structure. Issues in support of the agricultural enterprise change and the land-grant system is a mechanism for discovery and dissemination relative to issues.

29. The federal role in insuring training of a future workforce is absolutely essential. Innovations in food and fiber production must be studied for their impact on people, communities, and environment. The United States will assuredly lag in the world economy if attention is not given to this factor. When agricultural production methods become so efficient that only two to three percent of the population is engaged in the enterprise, it means a large proportion of the population once involved in agriculture may now be relegated to low-paying jobs or welfare. When major transitions occur in industries such as agriculture, steel production, etc.; to remain economically viable, the country must provide for retraining the workforce for new jobs in new industries.

Land-Grant Universities

30. See above discussion. The 1890 colleges as well as the 1994s provide a specific organizational structure for collaboration to occur between majority and minority institutions addressing agricultural problems. Collaborations among 1862s, 1890s, and 1994 colleges must be encouraged if resouces are to be used effectively. 1890s and 1994s colleges can provide "a safe environment" for young people to enter the education and research environments. Collaboration among 1862s, 1890s, and 1994s colleges can help assure a wider talent pool for agricultural research and education.

31. The funding formula for land-grant universities should be reexamined at least every ten years (and probably every 5 years) to determine if the criteria are appropriate. Criteria must follow the agricultural research and education priorities and change accordingly.

32. Land-grant university experiment stations are primarily supported by state governments with additional support from the federal government. Therefore the existence of state experiment stations will depend to a considerable extent on the interest and needs of the specific states. From a federal perspective, funding mechanisms which encourage collaboration among states should be enhanced. A unique value of regional or state experiment stations is the ability to focus resources on research which is regionally specific, that is culturally, climatically, or in soil and water resources.

33. Coordination of agricultural research among federal, state, and private institutions can best be assured by planning and priority setting groups with representatives from each of these entities.

34. The land-grant university system currently operates from four regional organizations for research and extension. These regions also have a great deal of interaction at a federal level through the National Association of State Universities and Land-Grant Colleges. Regional research, although organizationally is by geographic region, often crosses geographic lines to bring compatible research teams together to solve specific problems.

35. Cooperative regional research should be encouraged as well as multi-agency research. The focus should be on bringing the best research minds and facilities together to solve specific problems. A competitive grants process which encourages collaboration is a useful mechanism. The advent of telecommunications greatly enhances the possibilities for collaboration among researchers.

36. See item 27.

37. The National Science and Technology Council is a positive step in developing coordination across federal agencies. To be effective, its planning processes must include representatives from all agencies with the ability to address problems under consideration. To date, I believe that USDA and the land-grant system has been included in a number of NSTC discussion. I have personally participated in two over the past year. I believe that it is too soon to know how it is actually functioning. Agencies which have not formerly interacted must meet to find their commonalities. It should be indeed encouraged.

National Research Initiative

38. Fully funding the NRI at $500M from the current USDA research budget, given the climate of overall reduced resources, it not a real possibility. Certainly it is not a possibility from CSREES.

39. N/A

40. NRI appropriations have not been used to expand agricultural research as much as they have been used to focus agricultural research and to support a funding mechanism (competitive grants) which provides some flexibility in targeting research efforts. New areas for agricultural research which have received attention through the NRI include value added and product development, compatibility of production agriculture methods and conservation of the environment, and the social impacts (on people and communities) of agricultural production, processing, and marketing processes. The NRI has not been a stand-alone research initiative but has worked effectively in concert with priorities set by the Joint Council on Food and

Agriculture, ESCOP of NASULGC, the state agricultural experiment stations, other federal agencies, and private enterprise. It is the kind of research initiative which will help move the agricultural research agenda forward into the 21st Century and deserves to be supported.

Agricultural Research Service Laboratories

41. In the current fiscal climate, competitive research funding to existing universities adds value to the research investment. Not only can researchers within the university system affectively conduct agricultural research, but they are also educating the next generation of researchers and are informing clientele of research findings and applications directly through the extension service. These entities can perform the functions of the ARS laboratories and thus some duplication could be avoided.

42. Where ARS laboratories are co-located with land-grant universities, the benefits are mutual. Collaboration is fostered and expensive research equipment and laboratories can be shared. Co-location is a key factor in linking ARS and AES research work.

43. As I am not familiar with the priority setting process for establishing ARS laboratory facilities and the research agenda, I cannot comment on this question.

Extension Service (Extension Functions Within CSREES)

44. The extension service is very effective in carrying out its evolving mission. If the paradigm is shifting to realize that extension is a mode of education which disseminates needed research-based information to clientele rather than a delivery method for specific subject matter, it can be viewed as more effective. The USDA Extension Service works in close coordination with the state extension services which in turn work with county level professionals to deliver high-quality, research-based information in useable, understandable formats. It is a remarkable network of educators located in every county in the United States.

45. ES should most assuredly be addressing problems and challenges of urban populations. ES is part of CSREES and consequently will address problems and challenges which grow out of the information base of the agency, regardless of where the clientele happens to reside.

46. The ES most assuredly should be playing a significant role in mitigating social issues of people, families, and communities in rural America. The major transitions in agricultural production methods (based to a significant extent on USDA research) have impacted families and rural communities profoundly. If the agricultural enterprise is to flourish, it must be concerned about the life circumstances and economics of those who support the agricultural enterprise. Issues of balance in protecting natural resources and supporting a viable agriculture must be addressed as social issues as well as technical ones. The Extension Service is playing a significant role in providing research-based nutrition and resource management information to an increasingly multi-cultural society, often parts of society which have limited resources. For example, health care costs could be significantly reduced if nutrition and food safety information were readily available to limited resource families. Surveys across rural America indicate that issues of concern most often identified are social not agricultural.

47. The ES mission statement absolutely should not be changed to focus on activities on production agriculture. That might have had some relevance at the beginning of the 20th Century but most assuredly does not at the 21st Century.

48. ES should not be involved in the perpetuation of programs which have passed their usefulness or for which the research base has long been well established, or for which other sources of

information on the topic are readily available. ES should be interpreting research data and educating clientele to use it for their benefit.

Dissemination of Research Results

49. USDA's research results are disseminated to a considerable extent throughout the land-grant university system and the extension service. RFPs for competitive grants may well require a dissemination plan for both the scientific community and the public generally. The advent of new technology for communication provides many new opportunities for dissemination of information.

50. REE and CSREES should have responsibility for developing a marketing plan for agriculture science and education. It should be developed in conjunction with the land-grant partners, and collaborating agencies and industries.

Current Research Information System (CRIS).

51. CRIS is used by land-grant university scientists on a regular basis. Every funded research project at the station or regional level is regularly reported to the CRIS system. CRIS reports are generally brief abstracts which provide a snapshot of ongoing research, thus keeping researchers working on similar topics in communication with one another. CRIS is only one of many sources of research-based information used by researchers either in developing their research programs, communicating with colleagues of similar interests, and reporting their results.

52. CRIS is somewhat effective in helping to obtain information on federal agricultural research projects. In this age of rapid development of information technology, CRIS, to remain effective, must be one of the many "on-line" information services.

53. Yes, there should be an appropriate and adequate management information system for USDA research, extension, and higher education work.

54. No, the CRIS system as described above is limited in scope and needs to be carefully evaluated to determine whether it provides a nitch in the information system that is unique.

International Relations

55. International activities of USDA are essential in the time of a global society.

56. USAID has made significant contributions around the world to educate agricultural scientists in other countries and expand agricultural productivity. In a global society, USAID must remain involved with the agricultural enterprises in other societies but in a more collaborative than developmental mode. It is critically important to the well being of USDA agriculture to be knowledgeable and collaborative with agricultural scientists around the world. Competitive U.S. agriculture cannot survive in isolation. Global environmental issues significantly impact the productivity of USDA agriculture as well as that of other countries. Global warming, destruction of rain forests, and unchecked uses of water resources are examples of significant environmental impacts which must be dealt with collaboratively among nations for the common good.

57. USAID relys on the research and extension expertise available in the land-grant university systems and other parts of USDA. Funds are more wisely expended by contracting for expertise where it exists rather than recreating it. To my knowledge, USAID has not moved away from agricultural-related programs, if agriculturally-related is interpreted in a contemporary sense of the needs of the 21st Century. For example, protecting the environment while enhancing agricultural

production is a 21st Century issue. In many developing countries, women are the agriculturists and in the 21st Century are likely to be the managers as well as the producers of agriculture. USAID must recognize that and work with societies with respect to their cultural norms as opposed to overlaying U.S. cultural practices on societies outside the U.S. USAID indeed should contract through USDA/REE for long-term agricultural research and development. Scare resources must be directed toward science, not toward duplication.

INDIANA UNIVERSITY–PURDUE UNIVERSITY FORT WAYNE
DEPARTMENT OF COMMUNICATION

Sept. 22, 1995

Dr. John Goldberg
U.S. House of Representatives
Committee on Agriculture
Room 1301, Longworth House Office Building
Washington, DC 20515-6001

Dear Dr. Goldberg:

Enclosed are my responses to the list of discussion questions regarding the use of federal money. As you will note, my concerns center on vertical integration, maintaining a needed balance between city and country, acknowledging the credibility of the farmer as a change agent, and educating nonfarmers about farmers. I am especially worried about the failure of land-grant colleges and the USDA to address the problems faced by the mid to average-sized farmer. Please know that my responses are based on interviews with dozens of farmers and large body of ethnographic research. Unfortunately, none of mr articles have appeared in Rural Sociology. They have, however, appeared in various communication journals, newspapers, and farm magazines.

Please contact me if I can be of further help. I would be glad to provide you with more information. Thank you for your time.

Sincerely,

Mary Anne Higgins, Ph.D.
Assistant Professor

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1. The government should provide funding for research that is responsive to the USDA's constituency.

2. Goal setting should be coordinated with research activities and other federal agencies.

3. The process should include more input from small to moderate-sized farmers. Nominal group techniques and listening sessions involving owner operators would inform federal agricultural research.

4. Enhance research responsiveness to the farmer's concerns. Improve animal well-being and food and environmental quality by acknowledging the credibility of the farmer.

5. Research should concentrate on communicating with producers and educating consumers about sustainable agriculture. Sustainable agriculture should be the focus of all farm programs.

6. No.

7. Federal agricultural research addresses programs that result in quantum leaps of development that do not necessarily represent progress.

8. USDA/REE should give the farmer more management control by changing program requirements, including fruits and vegetables, and providing flexibility in planting decisions.

9. Listen to farmers and consumers and follow their suggestions for pooling resources.

10. Current agricultural research on sustainable agriculture is incompatible with other USDA programs that do not allow farmers the latitude to experiment with sustainable agriculture. Sustainable agriculture research is important to the EPA and other federal agencies. It can be done more efficiently and at lower cost by directly involving producers and focusing on local communities.

11. CSREES should function to support the small to medium-sized farmer by eliminating programs that allow corporations to profit at the expense of the family farmer.

12. Integrated systems programs should become a part of the federal research program. The extension services should function to extend the programs to farmers instead of university researchers.

13. I do not think they have been effective in prioritizing research and extension.

14. To my knowledge, none of the priorities has changed.

15. Priorities should be set according to the needs of the family farmer and local community.

16. If farmers play a central role as stakeholders, they should be given major decision-making authority. "Customers" and "partners" could be accommodated in one board.

17. No; we have enough problems in domestic agriculture.

18. The mix should be a 50/50 split that should allow for basic and applied research in other areas, particularly communication. Basic agricultural research is not always applied in working farm operations because communication obstacles exist between fund recipients and farmers.

19. I don't think it can be enhanced at current funding levels. Lower levels might encourage more locally controlled research.

20. By determining the impact multi-user programs will have on family farmers and consumers.

21. The standard of accountability is part of the land-grant university mission. Programs should function to extend research to farmers.

22. More special grants should be awarded because grants in the other categories require "insider" status. It is difficult to secure funding in those categories if the applicant does not conform to in-house, formula, and competitive standards.

23. All guidelines that function to enhance the balance between city and country should be considered.

24. By regionalizing research, the need for facilities will diminish. Localization will motivate local researchers to make do with present facilities.

25. Definitely; as long as vested interests do not interfere with project objectives and program goals.

26. The check-off fees do provide research and education funds. They should support long-term research.

27. 1. Listen to farmers.
2. Make it easier for people who are not affiliated with agriculture schools at land-grant colleges to access research funds.
3. Make research meaningful to the average to mid-sized farmer.
4. Admit mistakes when they do occur and try to rectify them.
5. Don't rely on diffusion of innovations research unless the innovation guarantees long-term positive effects for farmers and nonfarmers.
6. Acknowledge the farmer's credibility. One of the reasons many farmers do not adopt sustainable agriculture is that they view

it as a new name for an old practice, one which they were encouraged to abandon through high-input practices diffused through the change-agent network.

7. Ensure a market for products that the USDA promotes. Consumers may not be willing to pay a higher price for products that are grown via organic or sustainable agricultural practices.
8. Educate consumers about what it means to farm.
9. Educate USDA personnel and land-grant schools of agriculture about what it means to farm.
10. Discontinue programs that benefit corporate farms and encourage vertical integration.
11. Reward quality, not quantity.
12. Be open to more research addressing quality of life issues.

28. Congress should hold hearings with farmers and farm groups. Legislators should also investigate research policies and the ways in which land-grant colleges currently extend research to farmers.

29. The federal government should first define what it means by "future work forces" and explain why the term "farmer" is not highlighted. Then, the government's role should be to ensure that all players in the food and fiber industry are situated on equal playing fields. The government should also focus more on consumer education and less on research advances.

30. I believe that the role should remain the same: to extend research and other resources to farmers. Although the role of 1994 colleges has changed to reflect more of a focus on nonfarmers, the changes do little to promote more understanding between farmers and nonfarmers.

31. As noted earlier, current federal policies do give land-grant universities priority over individuals and agencies. It could be improved by making sure that all USDA information reaches all potential researchers at the same time and in the same manner. The connection between extension and land-grant colleges functions to exclude individuals and agencies who have no extension or college affiliation.

32. No. Many agencies have already been merged and the results of those mergers remain to be seen. In order to localize agricultural systems, the current system of research stations should be modified and streamlined. Conduct research where it will be applied.

33. Creative partnerships can coordinate the research, as long as representatives from governmental agencies and private institutions represent the interests of farmers and consumers.

34. The diffusion of innovations model should be modified to include a focus on communication. A communication-centered model points out current flaws in change-agent networks, suggests ways to increase the credibility of opinion leaders, and places the emphasis on the process of communication instead of the nature of the innovation. Current research in sustainable agriculture cannot

fit into the diffusions framework because sustainable agriculture is not a genuine innovation. Farmers don't need to be told that sustainable agriculture is a modified or re-introduced innovation. In fact, that knowledge often distances them from agents who advocate changes they once embraced.

35. It is highly appropriate to promote cooperative regional research. Consortia of states could benefit from federal funding as long as they are allowed to collaborate in the development of programs that are flexible enough to meet the needs of farmers and consumers. Federal funds should be used as long as they permit flexibility. Individual centers of excellence are too institutionalized to allow creative collaboration; small farms that sustain the country and the city should replace them. They represent the ways in which common ground can be cultivated between the Big City and the Back 40.

36. I don't think they are, but I am a biased researcher whose programs never get beyond the preproposal stage. Because the USDA agenda confuses development with progress, the federal sector often encourages the industrialization of agriculture. New partnerships that address the effects of corporate farming on the environment, rural communities, and animal welfare are needed. The partnerships should include the people who have been most affected by policies that encourage development at the expense of progress.

37. I had hoped that the National Science and Technology Council would consider the effects of technology gone awry or technological advances that compound social problems. An alternative paradigm should be employed that addresses the long-term impact of science and technology on farm and food policies.

38. The money should be transferred from sustainable agriculture programs because those programs are not beneficial to the small to mid-sized farmer. The NRI could use the funds to investigate why sustainable agriculture has not become a widely adopted innovation.

39. Congress could divert some funds from current farm programs by establishing eligibility requirements that limit producer income to $250,000 per year.

40. They have been used to continue programs. More money should be directed to expanding them, not in terms of production volume, but in terms of human benefit.

41. It should provide competitive funding to universities and other entities, such as research cooperatives and projects suggested and implemented by farmers.

42. I do not believe that ARS labs should be co-located at land-grant universities nor do I think that ARS research should be coordinated with land-grant university scientists. I'm not in favor of stronger links between State Agriculture Experiment Stations and ARS, either. I believe that the land-gant

universities and experiment stations have failed to serve the needs of farmers.

43. ARS laboratory facilities do not perform the kind of research needed to assist the small to mid-sized family farmer.

44. The Extension Service does not provide research results to the average owner-operator. In recent years, too much attention has been directed away from responding to the needs of farmers and toward responding to the needs of non-farmers.

45. As noted above, the ES is currently too involved in addressing problems and challenges facing non-farm populations, including urban populations.

46. In that much research has been done on social issues facing farmers nad rural communities, the Extension Service should play a vital role in disseminating that research, regardless of whether it was conducted at a land-grant university.

47. Yes, the role of the Extension Service to extend research findings to farmers includes activities on production agriculture.

48. The Extension Service should not be involved in addressing the problems and challenges faced by other populations until it can adequately address the problems and challenges faced by urban populations.

49. The USDA's dissemination of federal agricultural research results could be improved by giving agencies and organizations that are not affiliated with land-grant universities and the USDA stronger access to the results.

50. Local farmers, local leaders, and local educators should be given this responsibility. Marketing plans that target specific, local audiences should be developed by the people most familiar with that audience.

51. I do not use CRIS.

52. I am not qualified to comment.

53. As long as such reports reach all agencies and individuals who are committed to improving agriculture, management information systems would be helpful.

54. Although I can only comment on the USDA reporting system, I believe the agency does provide an adequate accounting of research and extension work.

55. Through the short term, the USDA can best support international activities by supporting domestic activities that guarantee an abundant food supply, a safe environment, and quality lives. In the long term., the USDA can best support international

activities by exporting the lessons learned in the short term.

56. I think the USDA's role in international research, education, and extension should be minimized until the agency has a firm understanding of its role in domestic research, education, and extension.

57. I believe USAID has moved away from agriculturally related programs. The long-term role of R&D should include the development of new markets. I do not think that USAID should contract through USDA/REE for long-term agriculture R&D.

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October 24, 1995

Congressman Pat Roberts
Committee on Agriculture
U.S. House of Representatives
Room 1301 Longworth House Office Bldg
Washington, DC 20515-6001

Dear Congressman Roberts:

This letter responds to your request for answers to questions regarding agricultural research, education, and extension.

1. The role of the federal government in agricultural research is to fund research that has a high social payoff but will not be funded by the private sector, states, or other firms or agencies. Examples are:

- Basic research that has no immediate application. Early work on biotechnology is an example.
- Applied research on national and international problems of modest interest to or with inadequate incentives for states or the private sector to address. An example is global warming.
- Applied problems characterized by large spillout of benefits over state borders. Havlicek and White estimated that approximately one-third of benefits of public state agricultural research spills over state boundaries. For example, research with a highly favorable social benefit-cost ratio of 1.5 will have a benefit-cost ratio of only 0.75 and hence be unattractive to a state that sees half of the benefits spill outside its borders. Adding in risk makes such socially beneficial investments even less attractive for states. On the other hand, states have great scientific expertise in land-grant universities and also a keen awareness of problems relevant to the state, region, the nation, and the world. Hence it is appropriate that research be performed in land-grant universities but funded in many cases by the federal government.

5. It is useful to divide agricultural research into three major areas: (a) basic or disciplinary research, (b) applied research on state and regional problems, and (c) applied research on national and international problems. The federal government is not good at choosing basic research; scientists interacting with the public are often best at choosing basic research topics that have the most promise and are suited for available scientific and technical skills. College of agriculture administrators, scientists, customer advisory groups, and interested laypersons are often best at determining appropriate targets for applied research. Public opinion, scientists, and the peer review process are often best for

determining national research priorities. Congress for example works through the GAO, the Economic Research Service and Agricultural Research Service of the U.S. Department of Agriculture, other agencies, and the National Research Initiative to select issues of national importance. On the whole, I judge that a reasonably good system exists for determining research priorities, including for federally funded agricultural research. The past record of agricultural research testifies to the fruitfulness of that effort.

One neglected area has been interdisciplinary applied research, but Colleges of Agriculture can remedy that by providing funds for interdisciplinary research teams set up to address priority problems.

7. Federal agricultural research does not adequately address research that would bring quantum leaps in benefits. It would be appropriate to provide more funds for basic research. Some of this can be allocated by formula to land-grant universities; other research funds can be allocated by competitive, peer-refereed grants.

8. The appropriate role for the USDA/CREES to ensure competitiveness in the face of decreases in price support programs is to provide more funding. The highest payoff from this will probably come from channeling funds to land-grant colleges of agriculture. Hatch and other formula funds are "block grants" which use federal funds to address priority research problems as determined at the grass roots by scientists, administrators, and laypeople. That is an excellent system for responding to real needs and has been highly successful in the past. It needs to be strengthened. Federal funding has remained nearly static in real terms for several years while state funding has expanded greatly. Currently there is an imbalance with excessive state relative to federal funding. That is, federal funding is inadequate to address spillovers discussed under (1) above.

10. Federal funding of economics has become increasingly fragmented. In recent years, Congress has looked increasingly to the General Accounting Office, public agencies funded by special grants, and others as opposed to the Economic Research Service of the U.S. Department of Agriculture to provide its economic intelligence. One result is lack of a critical mass of resources to provide proper economic intelligence. Another result often is for special grants to purchase the answers that Congress desires to serve special interests. Needless to say, this is very dangerous and the Economic Research Service needs to be strengthened and given greater independence so that it can provide objective analysis.

11. An important role for CSREES is to channel funds from the federal government to land-grant universities as block-grants. That is the most effective way for that agency to serve the agricultural research effort. It is appropriate that the agency take a low profile and not dictate research priorities.

15 and 16. Congress should consider rationalizing the current advisory system.

terminating many committees and replacing them with one committee for planning and prioritizing agricultural research. That advisory committee could be comprised of scientists, producers, consumers, taxpayers, and individuals representing the public at large. It is my belief that consumers are our partners in research, and producers and consumers should be on the same board.

22. Much special grant funding is for political rather than economic or scientific value. Grants funded for political reasons tend to have very low payoff measured in economic or scientific terms, and need to be eliminated. My reading is that formula funds have the highest payoff because they require relatively low administrative overhead and are allocated at the grass roots level by people who have knowledge of priority issues and efficient means to address them.

The competitive grant program has been too small to operate efficiently. Massive resources go into writing proposals, refereeing competition, administration, and reporting. These costs may exceed the amount of funds dispersed as grants. Competitive grants sometimes also divert scientific resources from high priority local purposes to address low priority national issues. Competitive grants need to be either phased out or expanded in scope to reach a critical mass of resources.

26. My impression is that "check-off" fees on commodities provide resources mainly for short-term research and education. Most of that effort is to promote product sales rather than to increase agricultural productivity. Check-off fees are frequently used to encourage consumers to eat unhealthy diets. It is inappropriate for the federal government to facilitate such efforts.

27. A major problem of agricultural research is not the institutional environment for providing it but inadequate federal funds both for basic and applied research that spills over state boundaries.

29. The training of future work forces for food and fiber needs is primarily a state rather than a national responsibility.

30 and 32. It is entirely appropriate to maintain a decentralized research system capable of responding to problems at the grass roots level. That is the strength and genius of the American system. However, it is wasteful to have more than one agricultural experiment station per state. In the case of some small states, such as in New England for example, it may be appropriate to consolidate some of the state experiment stations into a regional experiment station. Separate funding of 1862 and 1890 land grant colleges' research is not efficient.

38. The National Research Initiative (NRI) Cooperative Grants Program needs to

be fully funded. Funds should come from phaseout of commodity programs.

39. Funds phased out of special grants should fund the NRI program.

42. The American research model of combining research, teaching, and extension has been the envy of the world. That remarkable land-grant university concept needs to be continued. ARS laboratories need to be co-located at land-grant universities to exploit that synergism.

44. The Cooperative Extension Service is continually changing through time to meet the needs of its customers. The ES is effectively carrying out its mission.

46. The ES needs to provide objective information on social issues facing farmers in rural communities. It is inappropriate for ES to become a social activist agency.

47. The ES needs to include activities broader than production agriculture.

57. USAID has substantially shifted its focus from agricultural research and extension to other issues such as democracy, women, population planning, and the like. The poorest countries of the world are heavily agricultural. They will make very little progress in democracy, rights for women, population restraint, protecting the environment, and the like without improving their agricultural productivity. USAID funds need to be redirected back to agriculture. The agency needs to work with others including the CGIAR system to raise the productivity of agriculture. The United States has lagged seriously in the provision of aid to poor countries. Poor countries will not invest even in high payoff agricultural research because they do not have the means to do so. Agricultural research improving the productivity and well-being of people in agriculture brings general economic development. Countries that get their economy moving will be good customers for our farm products. We do not benefit from the Haitis and Ethiopias of this world, but we do benefit as sellers of agricultural products from having more Taiwans, South Koreas, and Indonesias.

Please let me know if I can be of further assistance.

Sincerely,

Luther Tweeten
Anderson Professor of Agricultural
Marketing, Policy, and Trade

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November 1, 1995

Dr. John Golberg
Agriculture Committee Staff
U. S. House of Representatives
Room 1301, Longworth House Office Building
Washington, DC 20515-6001

Dear Dr. Golberg:

Enclosed are responses to the questions posed by the General Accounting Office for the purpose of assisting the House Agriculture Committee.

The procedure followed in collecting these responses was a three-part solicitation as follows:

1. draft by Allen and selected key people;
2. draft circulated to executive committee members for input and comments;
3. finally to AAAS society liaison representatives for their input and comments.

At each stage input and comments were incorporated. A total of 55 were asked for their input and the enclosed is the result of this process.

To give emphasis to some points, different responses are included depending on whether the perspective represents USDA-funded research through universities, or USDA-funded research through laboratories. The extent of the process of solicitation meant there was not one culture with one voice for Cooperative Extension, ARS, and the Agricultural Experiment Station. Because each serves in its own way, they have been given a voice that has been maintained in the responses.

We appreciated the opportunity to respond to these questions.

Sincerely,

C. Eugene Allen by
Marilyn [illegible]

C. Eugene Allen, Chairman
American Association for the Advancement of Science
Section on Agriculture

CEA:rs

Federal Research Goals

1. What should be the role of the Federal Government in agricultural research?

RESPONSE 1: Categories of research, basic, e.g., molecular biology or ecology, and applied, e.g., development of new crop cultivars or crop rotations, are not mutually exclusive and a continuum of research from basic through applied is necessary for the success of agriculture. In an applied science like agriculture, we must integrate basic and applied aspects of our research program to be effective and to serve our clientele groups. Basic researchers need to have their research programs as part of a continuum with the more applied scientists that conduct the research prior to it being recommended by extension specialists. The appropriate balance is a programmatic decision that must be based on a comprehensive assessment of the overall goals of the program with consideration given to the entire research portfolio -- both public and private. It is estimated that the private sector allocates about 10% and the public sector about 40% of agricultural research funding to basic research. If credible, long-term development of agricultural systems is to be successful, support will be needed for the entire continuum of research, including multi-disciplinary and system research at all levels.

Most emphasis should be placed on basic research, but with broad application, leaving site-specific application to state or local levels. Research must be responsive to give leadership in exposing the appiicability of more basic findings. Research should be sensitive to international research trends from competing nations and to industrial research trends, that is, to the marketability of ideas, yet supportive of researching technologies that may favor direct benefit to industry and indirect benefits to the producer and consumer.

Because the demands on research are complex, a variety of funding mechanisms may be necessary to meet them. A shift in the funding support to include more basic research, but with a means for allowing the continuum of research needs to be addressed:

- Provide funding for basic and mission-oriented research that is at a level comparable to the importance of agriculture to the nation's economy.

- Some of the funding should be awarded through a competitive peer-review process, but be aware of significant problems caused by grants that are too small or too short-term in duration.

- Facilitate technology transfer to the private sector.

- Invest in partnerships with industry.

- Some federal research should be considered as high risk research, where the payoff may not be immediate, but is necessary for the major breakthroughs that are crucial for agriculture to maintain a strong competitive advantage in the global arena.

- Maintenance of a strong and responsive research infrastructure that can respond quickly to crises, such as insect and disease infestations.

RESPONSE 2: The Federal Government should fund primarily long term, high risk research that has applications over a wide geographical area of the U.S. This research should continue germplasm improvement in both plants and animals. A large proportion of the research should include addressing value added and new uses for crops. The public sector has an obligation to do exceptional applied research in areas where commercial companies do not believe there are viable markets. Market driven research does not mean that all necessary applied research will be undertaken. Examples of the research USDA/ARS should support include: selection of plants for phytoremediations of soil and water; improvement of plants and animals through biotechnology; alternative uses for plant and animal products; and improving traits that help plants and animals adapt to nutritional and environmental stress. USDA/ARS is the logical place to do some research that requires specialized facilities such as highly contagious animal diseases.

RESPONSE 3: Hatch Act and McIntyre-Stennis funding to the states through CSREES is very important as it leverages state funding for agricultural research. Most states provide about $4 for every Federal dollar.

RESPONSE 4: The Federal Government should primarily sponsor basic research with applied research funded under circumstances, e.g. outbreaks of new diseases and pests, in which not doing so would result in significant loss of an important commodity.

RESPONSE 5: The Government should be funding high risk research at the basic level. IT also should be the primary funder of the research that is not directly commercialized, e.g., alternate biological controls. It also should be a major funding source for watershed level research where teams are an important part of the research/education process. Team work is hard to fund, and the overarching role of Federal programs will be very helpful in putting together watershed level studies.

2. To what extent should goal setting and goals in agricultural research be cognizant of and coordinated with research activities in the rest of the Federal sector (HHS, EPS, DOE, etc.)?

RESPONSE 1: It appears that goals and goal setting need a more bottoms-up approach to assure that agricultural research and related programs are on target and held accountable. This requires input identifying the needs/issues from all sectors of agriculture and then a consensus process at each level, not only within government but also within agencies and ultimately across, establishing national goals. Thus, a more coordinated approach appears essential. Some of the elements to consider include:

- Agricultural research at the Federal level must be coordinated with other general research activities. This is most relevant in the environmental and health related areas where there are often regulatory and research activities that are not consistent in goals and objectives.

- Such a bottom-up approach will assure that our agricultural research and other programs are on target and it will also enhance the buy-in for citizens to support agricultural research, extension, and education.

- Goals must be broad at the national level with further definition as implementation and objectives are set at the state and local levels.

- Once goals have been set and programs funded, then the best possible science must be accomplished by the most appropriate scientists and the work completed in an unbiased and efficient manner.

- A major issue is the perceived secondary status of agricultural research and agricultural researchers. Overcoming these credibility issues will be a major hurdle, but they must be addressed if 'agricultural research' is expected to remain viable as a separate focus in the entire science spectrum.

RESPONSE 2: Administrators certainly should be cognizant of what other research sectors are funding, but coordinating efforts may lead to less diverse approaches to scientific questions, a situation that should be avoided.

RESPONSE 3: Goal setting within the Federal research complex is an ideal that politics may never allow to completely happen. The best we can do is keep the goals of agriculture high on the agenda in the government and keep communication flowing. The political process will have to be a key player here.

3. Is the process associated with the Food Animal Integrated Research for 1995 (FAIR '95) adequate for the development of Federal agriculture research goals? Are there goal identification processes which might better serve to enhance Federal agriculture research other than FAIR '95?

RESPONSE: The FAIR '95 process is a useful model for developing goals for all agricultural research in the sense that it involved all stakeholders and was then endorsed by them. The adequacy could be questioned, however, particularly relative to basic scientific knowledge. It was not intended to cover all of agriculture, but its goals are more broadly pertinent in some instances.

4. If the process of FAIR '95 were to be used to adopt an agenda for Federal agricultural research, how would the goals identified in FAIR '95 and listed below, need to be modified to address the concerns of all research stakeholders?

1) Enhance industry wide responsiveness to consumer and societal concerns;
2) Meet and market demands through increased efficiency and competitiveness;
3) Develop integrated food animal management systems;
4) Maintain and enhance environmental quality;
5) Improve food quality control in terms of safety, desirability, and nutritional composition; and
6) Enhance animal well-being throughout the life cycle of food-producing animals.

RESPONSE: The Federal government should sponsor a continuum of research with an emphasis on basic research but including long term applied research needed to address changes in pests, little grown crops or animals, environmental or health related impacts and the future, providing competitive high quality supplies of food and fiber.

The above goals begin with responsiveness to consumer and societal concerns, a goal which certainly applies across the board. The second demonstrates the need to continue efficiency and competitiveness; factors which can no longer be the only focus, but must share the agenda. The third, fourth and fifth goals cover current societal goals that impact both plant and animal agriculture and the wording could be modified slightly by adding plant systems so as to broaden the coverage. The sixth and final goal on animal well-being is obviously oriented toward animal agriculture but is in line with current societal interest in concern for how animals that produce food are raised and processed. It seems likely that a slightly modified set of goals could be derived to include plant agriculture, microbes, and societal issues in a broader context of these FAIR '95 concepts.

Priority Setting

5. Is Federally funded agricultural research focused on the issues of highest priority for producers, processors, and consumers? If not, how can the priority setting mechanism be improved to insure that these issues are addressed?

RESPONSE 1: For the most part Federally funded agricultural research is focused on issues of high priority for producers, processors and consumers in that prioritization process. It would be possible to develop an advisory group composed of clientele and university personnel that might annually consider the issues facing the agricultural community and prioritize those issues that need to be addressed with agricultural research resources. This is being done piecemeal with many different kinds of advisory committees in many states presently, but there is not a coordinated effort to accomplish the prioritization process with clientele participation. There should be a single stakeholders' advisory board rather than multiple boards made up of special interests.

RESPONSE 2: USDA/ARS research should be more highly focused on consumer and producer needs. Processors will adapt to what science produces. It would be good to have regional meetings which include scientists, producers, consumers and administrators to brainstorm priorities. The meetings should occur about every third year. They should not only assess priorities but review major progress. The agricultural agencies should have visionary conferences, similar to those just completed by USDA/ARS.

RESPONSE 3: Agricultural research must reflect more than a production paradigm. Agriculture, in the broad scope as a human activity, must include in the priority setting process the social, nutritional, and environmental impacts as well as the production, processing and distribution issues in determining who are the primary and secondary beneficiaries of federal research.

The agriculture-food system extends from production agriculture through the food processing, distribution and food service sectors to the consumer. Important research on the fundamental physical, chemical, biological and nutritional properties of foods is included in USDA-funded research at the land grant universities and is beyond what industry has been willing or able to fund.

RESPONSE 4: In general, Federal funding for agricultural research has been focused at producers, processors, and consumers. This is difficult to deal with because of the nature of research at the more basic level. The major problem is that it is difficult to predict the utility of research for the future. This is especially the case as the research scale becomes more basic. Some suggested elements to consider:

- When setting the priorities, state/regional input is critical and the goals at the national level should be sufficiently flexible so that the goals and objectives can be set at the local level to meet local level concerns, needs, and issues.

- Utility of a given research effort changes with time, often depending on how the research is followed up or how the problem emerges.

- It is important that the Federally funded research maintain a balance of both mission-oriented and basic research. Without the continued input into the scientific knowledge base through basic research efforts, new breakthroughs in technology will not be possible.

RESPONSE 5: USDA needs to have more consumer focus. Its research programs continue to be top-down driven, and agricultural interests dominate the process. Consumer focus groups will help, as will having administrative input outside the Beltway.

6. Should Federally funded agricultural research address specific technological and industrial needs? If yes, does the present system fulfill this goal (if not, please describe how this can be accomplished)?

RESPONSE 1: Stakeholder (but cross-commodity) advisory boards need to play an appropriate role in setting the research agenda. Although the needs of various commodity groups have specific differences they also have a lot in common. We need to identify those common issues that will benefit clientele groups of all kinds and use those issues as rallying points to provide unified support and feedback to universities on how they use their resources, both state and Federal. Both customers and partners can be accommodated on one board and it is crucial that they hear each other in prioritizing the use of state and Federal funding for research and education.

RESPONSE 2: Federally funded research should address basic scientific questions and help provide a work force that is trained in the sciences, a work force that industry can draw on to solve its technological problems and product development needs. If private industry wants specific questions addressed, it can do so by in-house research, by contracting with university researchers, by creating research consortia, etc.

RESPONSE 3: A balance needs to be achieved between short-term focused research and long-term research that is less focused, but still has applicability. Some additional considerations include:

- There should be limited effort on basic research that does not have potential for application to agriculture within the next 10-20 years.

- Industry should be in communication with the Federal research establishment insuring that technology transfer is made, allowing the industry to take major research leadership early. Thus, over the long term, the shift in Federal research will gradually move to more fundamental areas, being fully connected and able to transfer the leadership for developing applications to industry.

- It is important that agricultural research at the Federal level and within the Agricultural Experiment Station (AES), be in concert with the Extension Service, and maintain a non-biased approach to the development and distribution of research results and information.

- Examples of areas needing continued support from the Federal Government and experiment station network may include air and water quality, soil erosion, value of diversity, and biocontrol methods, *i.e.*, areas important to society, but which do not have a product nor a controlled technology that is salable by an industry.

7. Does Federal agricultural research adequately address projects that result in quantum leaps in benefits, or does it dwell too much on incremental benefits?

RESPONSE 1: The current system is thorough in addressing projects that could result in quantum leaps in benefits. The partnership of Federal agricultural research and universities in every state generates new knowledge, communicates that knowledge to those who need it, and continually educates new generations. Quantum leaps are potentially more possible if flow of information is considered and we can become even more adept at needs assessment and deployment of results. A larger question is how are benefits measured? Certainly economic measures are important, but equally critical is benefit to human-kind. As we move toward a broader scope for agricultural research we address the growing diversity of science as well as contemporary concerns of both domestic and international consumers.

RESPONSE 2: In recent years, most agricultural research has resulted in incremental benefits. The discovery of hybrid corn was a quantum leap, and perhaps biotechnology will lead to other quantum leaps. The easy problems have been solved, and most advances in the future are more likely to be smaller incremental changes. These smaller changes are extremely important, however, as they have led to steady yield increases in crops such as corn and soybeans for years, and have helped U.S. to maintain its competitiveness in international markets.

8. What is the appropriate role for USDA/REE in insuring competitiveness in the face of decreases in price support programs?

RESPONSE 1: Farmers and agribusiness people face increasingly complex world markets, cost competitiveness and growing expectations to be good environmental stewards. (taken from minutes of NCR Assn. of State Agricultural Experiment Station Directors Meeting--July, 1995) To address these issues:

1. Foster intercollegiate and interregional collaboration to insure that the issues are properly addressed.
2. Assist the agricultural system in the transition to the more competitive environment and stress balance between research and extension portfolios.
3. Bring resources to address value-added economic activity in the rural sector.

RESPONSE 2: USDA/REE should focus on research that is difficult for the private sector to pursue. True innovation in product development can be Federally funded, but most product refinement and development should be left to industry.

9. How can the appropriate Federal-state-industry resource pools be integrated to develop high priority regional programs in research, teaching, and extension?

RESPONSE 1: The importance and value of integrated resource pools is manifold:

- Such integration is not easy to accomplish, in that it requires effective leadership and salesmanship by officials and scientists in the public sector to convince the private sector to get involved in cooperative efforts that will benefit both public and private interests.

- An example of such an approach is the Germplasm Evaluation in Maize (GEM) project that was initiated during the past year. This project involves Federally funded research in USDA and state laboratories, with in-kind service being provided by private industry researchers. The overall goal is to identify useful genetic materials in exotic (largely Latin American) sources of corn and then integrate these genetic factors into U.S. breeding programs, both public and private. To accomplish this, private industry *managers* and *scientists* had to be convinced of the benefits for their companies. Scientists in the public arena convinced their private industry counterparts, and then decision makers had to be convinced to provide funds for this research.

RESPONSE 2: What is happening right now in many states will assure this integration. Increasingly specific projects must rely on funding from industry. This means that integration of Federal-state-industry resources is naturally occurring. As funds diminish and projects must continue and increasingly rely on industry resources, both the communication channels and resource allocation must follow.

10. How important is the Federal agricultural research role in supporting other agencies of the USDA? Of other Federal agencies? Could this be done more efficiently at lower cost?

RESPONSE: The role of Federal agricultural research in supporting other agencies is critical; however the system of policy and regulations seems to be running ahead of research initiatives. Efficiencies could be created by submitting RFPs for specific targeted needs.

11. USDA reorganization created the Cooperative State Research, Extension, and Education Service (CSREES). In your opinion, how should this newly configured agency function to support the U.S. agricultural enterprise, 1995-2002?

RESPONSE: The reconfiguration of these--Research, Extension, and Education into the CSREES--is the right first step in assuring that these relationships remain strong and address issues jointly.

The current increase in the number of faculty appointments that hold joint Research and Extension percentages is a futuristic direction. However this is just the first step. The infrastructure of the respective organizations will have to be streamlined so that people can communicate more readily and the boundaries within an organization are reduced. The federal bureaucracy for CSREES in Washington, D.C. needs to be minimal. The action, e.g. challenges and opportunities, is in the states near the scientists, students, constituents.

12. What is the proper place for integrated systems programs? What role should the Extension Service (extension functions within CSREES) play in these programs?

RESPONSE 1: Integrated systems programs are the future of agricultural research. Even the most basic research will eventually be used in the context of a system. Hence the proper place for integrated systems is to focus all research. They are the scientific hubs.

The lack of outreach and research on integrated systems is an area where we draw considerable criticism within land grant universities. Producers consistently demand information in whole systems rather than components. A major role that the Extension Service can play in this process is to encourage and promote the involvement of producers and other private sector clientele in helping to deliver such educational programs. Land grant universities need to acknowledge that producers are often the best integrators of research and educational information and they need to be brought into the educational process as partners.

RESPONSE 2: The ES should play a larger role by working more closely with researchers, and/or getting more involved themselves in research on integrated systems. With more joint appointments in research and extension for faculty at many universities, these faculty should be most qualified to conduct the applied site-specific research needed for implementation of many of the integrated systems. The need by producers for systems advice make the Extension role more critical than ever.

Advisory Boards

13. Have USDA's research and extension advisory and coordinating boards been effective in planning and prioritizing agricultural boards? (please explain)

There are too many special interest advisory boards. We need one with broad interests and representation and a commitment from REE to listen to it. State and national advisory committees may have different objectives.

14. How have research or extension priorities been changed as a result of the recommendations of the advisory boards (please provide examples)? Are there presently too many advisory boards?

RESPONSE: The setting of national priorities is an ongoing yearly process. In ranking national priorities some issues can be accommodated, but some can not. Regional and state issues must still be considered at the regional and local levels and there must be flexibility to address such issues. National priorities can only be meaningful if done in a very thoughtful manner. People with narrow views have nothing to contribute.

15. What options should Congress consider to improve USDA's process for planning and prioritizing agricultural research? (i.e. how should the research agenda be prioritized?)

RESPONSE 1: There are perceived changes that have occurred over the years, which have limited the response of the USDA to address national research priorities.

- The USDA should be given the freedom (mandate) to focus on national problems. Often, specific research priorities are focused on items of limited scope, such as funding within a single state or limited regional area. Such projects of limited scope frequently require the movement of personnel and funds form strong nationally focused programs. Many such projects could be funded by applicable states or, perhaps, by private industry.

- Congress should refocus the in-house Federal research programs on areas of national significance that are so necessary to assure the U.S. competitive advantage in the global research arena as well as in the global agricultural production arena. USDA-ARS became the premier agriculture research institution in the world during the 1950's and 1960's when research areas of major national programs were addressed. Because of reorganization into regions and areas, and because of increased Congressional influence, the ability of the USDA-ARS to maintain the strong national focus and the global competitive edge has greatly eroded.

RESPONSE 2: Congress should rely more heavily on input from research administrators than on lobbying from large commodity groups. Stakeholders advisory councils are useful in identifying the problems growers and processors face. However, these councils frequently have heavy representation from the large-acreage commodities (corn, wheat, cotton, and soybeans), and tend to give priority to research on these important crops. The same is true on the animal side. Advice should also be sought from the researchers about the areas in which technology is available for major advances. The administrators from USDA and state agricultural experiment stations should prioritize the inputs, and advise Congress.

RESPONSE 3: The concept of regional research needs to be reexamined and addressed, i.e., how priorities are set, the process of funding.

RESPONSE 4: Consider the establishment of an internet home page and/or Email linkage to solicit inputs on research needs and priorities from the grassroots such as professional communities and educational societies.

16. What role should stakeholders advisory boards play in setting the agenda? What groupings should be represented on advisory boards? Can "customers" and "partners" be accommodated on one board or will it require two?

RESPONSE: In many instances in setting up a research agenda based upon special interest advisory boards, we end up with the "problem of the year." Advisory boards of both "customers" and "partners" provide important input but the information needs to be placed in perspective of long term goals. Definitely, do not have two separate boards. However, there should be ways to use input from both boards to formulate policy.

17. Is there a special role for advisory boards to play in international agriculture beyond what has occurred in the past?

RESPONSE: The current focus of some advisory boards in international programs is not on food. Yet such an issue as lack of food is a growing problem with expanding populations. The retraction of support from the AID agenda of the University is problematic because then the continual critical programs are not addressed. Certain issues such as access to the germplasm of the world is essential for U.S. scientists. Then they could focus on global interactions and thereby advance service to U.S. agriculture.

To be effective we need stable funding. Year-to-year or project-to-project funding does not have long term effect, except as we train future leaders for the country's agriculture programs.

Funding Considerations

18. What is the most appropriate mix of Federally funded basic and applied agricultural research?

RESPONSE 1: (also addresses aspects of questions 30-35). Federal research in both ARS and Competitive Grant Programs should have a large portion of their research dollars going to basic (fundamental) research. However, basic research encompasses areas far beyond gene cloning and biotechnology. Basic research includes topics like assessment of whether intercropping is economically viable for U.S. agriculture; can plants be selected for removing toxins from the soil; can we manipulate plant metabolism to make crops more efficient in utilizing nitrogen. Most state funding should support applied work directly related to the state. In future years this may require that states share research efforts and these efforts include overlapping geographical locations. The notion that every state needs to support many branch stations may be a poor one even though much of what needs to be done is somewhat site-specific. Lastly, other than having ARS scientists at regional laboratories, all field-located ARS scientists should be at university locations.

RESPONSE 2: Many of the items concerning basic and applied research were addressed in Question #1, however there are a few further points to consider:

- The Federal Government is in the best position to be the major funding source of basic research, therefore, this must be a priority.
- To ensure the most efficient pursuit of applied research, jointly funded partnerships with industry must be developed to facilitate the transfer of information and technology to the customer.

19. How, if at all, can the effectiveness and efficiency of agricultural research be enhanced at current funding levels? At reduced funding levels?

RESPONSE 1: Reduce the number of national laboratories and field stations and redirect the funds through CSREES formula and competitive programs where things are done relatively efficiently. To do even better, streamline and re-engineer the bureaucracy of CSREES's way of doing business.

Land Grant Universities and the USDA should make a better attempt to integrate all university researchers into agricultural research programs. Researchers outside agriculture schools tend to be interested in and have more experience with basic biology and research than do their colleagues in agriculture. There are several examples of fruitful collaborations between researchers in agriculture and biology, but the number is much less than it should be. The reasons are complex and relate to real or perceived rewards for teams' verses individuals' access to interdisciplinary grants, and policies of some journals. These joint research programs often lead to novel and effective approaches to gaining knowledge and benefit the institution, researchers and students.

RESPONSE 2: One of the great hindrances to modern agricultural research is the continued reduction of support for long-term projects. The time researchers spend searching for funds which usually cover just short-term projects has greatly restricted the type of projects that researchers will consider undertaking, even if such projects are of high priority and of great need. Research on agricultural systems of necessity must be multi-year and often of fairly long duration to be useful. Setting aside a certain portion of agricultural research funds for 5 or 10 year projects would go along way towards insuring that this type of research is not eliminated.

20. How can future funding be determined and justified so as to permit multi-year programs to be completed?

RESPONSE: Downsizing of programs at the Federal and state levels will necessitate careful planning and priority setting. Selection of the most critical multi-year programs will be necessary.

21. In view of the growing emphasis on greater accountability of Federal expenditures, do you have any suggestions as to how agricultural research results can be measured and their impact evaluated? Is there some standard of accountability for the efficient and effective use of Federal research funds?

RESPONSE 1: The system of accountability is set up for efficient and effective use of Federal research funds with the reporting system currently in place. The 1995 Joint Council on Food and Agricultural Sciences of the USDA reported each Federal dollar appropriated for agricultural research, extension, and teaching leverages 4-5 state, local and private dollars, with a measured annual rate of return between 30 and 50% depending on location and commodity. How much more effective can we get? For the question of measuring results and evaluating impact, it is imperative that criteria be discussed and set forth that do NOT just include economic measures, but also include research results measured for their impact upon our society.

The SAES system as a whole and individual Experiment Stations are in the midst of profound change. As land-grant institutions become more diversified, the role of agriculture in the total academic environment is being redefined. Examining both the biological and social consequences of research is increasingly important and this calls for new inter-and multidisciplinary research efforts (from RESEARCH AGENDA for the 1990s).

RESPONSE 2: There should be full cost/benefit analysis that takes social and environmental factors into account. Some research funding should be directed to how this analysis can best be done.

22. What is the proper balance between in-house, formula funds, competitive grants, and special grants?

RESPONSE: The basic problem is that faculty and research spending is inappropriate with the time involved in seeking grants and writing reports. As formula funds have decreased, we have lost the ability to control our own destiny and set priorities. This requires each faculty member to become an entrepreneur at the risk of adequately serving the people. To accomplish mission oriented research requires adequate funding. "Pork" funded projects ought to be eliminated.

We need to be mindful that the agricultural research funding has had a high rate of return as reported by numerous economic means. This has come about through formula funds, so we can not talk about failing society through the use of such funds.

To have integrated programs, administrators need to have some funds to cause the integration. Competitive grants are mostly individualistic and often promote individual effort at the expense of a more integrated effort.

23. What guidelines should be used in determining appropriations for "specified programs" in research, education, and extension?

RESPONSE: Guidelines used for determining appropriations should be as follows: 1. examine and fund the "real" costs; 2. consider the social ramifications; 3. separate issues, that is, whether they are national, regional or localized, and then prioritize funding accordingly.

The system has to give administrators more leeway in funding programs. Presently administrators often have to prostitute themselves for funding from too many sources.

24. Should Federal funds be used for programs only, or for facilities as well? If for facilities, how should they be allotted--competitive proposals or other? Is there a place for regionalizing research, increasing competitive grants, etc.?

RESPONSE 1: Yes. Federal funds should be used for both programs **and** facilities. Proposals for facilities should be competitive and emphasize/reward matching funds and cooperative multiple interunit/interdisciplinary uses. Proposals for facilities should also include such factors as operation and maintenance of the facilities. No "pork" funded facilities should be permitted.

There is a place for increasing competitive grants, but real costs need to be considered. If criteria for such competitive grants included collaborative efforts, regional research would follow. To force such research is not useful, as some projects would benefit from such regionalizing and others would definitely not. There is no magic formula for such efforts. We cannot afford to have more faculty time devoted to writing grants. The cost is already very high and the average grant is too small and too short term.

RESPONSE 2: Not at least in the current climate of ever reduced funding. In general, we are over-built, and build in the wrong places, with respect to program funding. It is all too "easy" to "get" a building, but without enough continuing funding to sweep the floors or empty the waste containers, let alone program support for activities for which the facility was erected in the first place.

RESPONSE 3: The use of Federal funds for facilities places a long-term commitment to maintaining a building in lieu of having funds for research. By placing field scientists from ARS in universities there would be little need for Federal facilities. Funds currently going to fund buildings could be redirected with a portion going to research and a portion to universities for overhead and/or building maintenance. The only field buildings that ARS should maintain are Beltsville and the Regional Laboratories.

RESPONSE 4: No federal funds should be used for buildings but rather used for funding major equipment needs and enhancing current funding for grants. We need a separate competitive grant program for facilities to overcome the pork barrel that is occurring now.

25. Is there a place for partnerships not only with state and local public sector organizations and industry, but also with private foundations?

RESPONSE: There is a place for partnerships of all kinds. We need to be more creative in seeking out partnerships and developing the energy that is needed to accomplish research and educational initiatives that will benefit all of agriculture. We should not limit our thinking in any respect. We should encourage innovation with respect to how we partner.

26. To what extent do self-assessed "check-off" fees on commodities provide resources for research and education? Do these/should these programs support long-term research, as opposed to short-term product development and promotion research?

RESPONSE 1: Such fees are extremely helpful. We could not have served these sectors of industry without their support. We have had minimal problems and the two-way flow between science and industry is useful. Promotion research can be supported at universities and ARS by check-off dollars, but ARS based funds do not support these activities.

RESPONSE 2: Check off fees are a good way to get consumer buy-in, but stay away from using them for any promotion.

Delivering Agricultural Research

27. In order of priority, what would be the most significant actions USDA could take to improve its management and/or delivery of agricultural research?

RESPONSE 1:

1) Reduce the incredible loss of productive research effort expended in awarding competitive research grants. Particularly for our beginning investigators, our brightest and most productive individuals, the amount of time (time is money) and energy spent in the attempted acquisition of funding support is self-destructive. All in the name of accountability, the amount of lost scientific effort spent in proposal preparation, review, re-submission, re-review, and administration is far greater than any of us are willing to admit.

2) Eradicate the concept of "leveraged" funding, some call it "matching funds". Currently we are leveraged to death. This concept is confounding the inefficiencies discussed in part 1 above. For example, a chemical company may have received $50,000 worth of research on some new product, by simply providing $5,000 of funding to the university. Research funders use the concept as a simple tool to re-direct someone else's dollars to their favorite project.

3) Introduce a mechanism to fund long term research. The idea that research projects can be initiated and completed in a 2 to 3 year time period, is simply wrong. Trying to fit research projects into this model leads to unnecessary inefficiencies and, hence, wasted resources.

4) Shrink USDA in Washington and put savings into supporting programs.

RESPONSE 2: ARS could improve its management and delivery of agricultural research by locating virtually all of its scientists on university campuses. This would increase their interaction with other scientists, and would provide more interaction with state extension specialists who could "deliver" their research to the stakeholders.

RESPONSE 3: The current NRI system seems to be working fairly well. We need to keep peer-reviewed competitive grants to retain high quality. Overleveraging is a major problem.

If USDA loses NRI funding, young faculty will still be writing proposals to NSF etc. There will simply be fewer dollars available, so the situation described will be exacerbated. Yes, the awarding of competitive grants is expensive, but the peer review that occurs results in high quality science being funded. If ARS research were subjected to the same level of peer review, we would get more value for dollars.

28. What options should Congress consider to improve the delivery, results, and benefits of Federally funded agricultural research?

RESPONSE: The Government Performance and Results Act of 1993 mandates how CSREES will meet requirements to develop an accountability system based on performance measurement, including setting goals and objectives and measuring progress towards achieving them. The GPRA 10 year budget management reform requires: each agency adopt operating procedures that provide measures of the impact of Federal expenditures at the customer level and allocate program resources in accordance with demonstrated program effectiveness. How this plan is implemented will be critical, as such a complex regulatory mechanism can not be taken lightly in terms of human resources investment. This is another example of increasing Federal bureaucracy that will only decrease the return on our investment. Federal agricultural research and education funds should be given as block grants with simple accountability mechanisms. When only about 9% of agricultural research funds in this state come from the federal government, the GPRA of 1993 is a very heavy burden on time and resources.

29. What should be the Federal role in insuring training of future work forces for the food and fiber needs as well as the natural resource concerns of the public?

RESPONSE: The Federal role should be to facilitate the state universities as much as possible. We need to think more seriously about assisting with implementation and maintenance of large investments in new technologies and increase equipment and teaching facilities related to food and natural resources. Infrastructure issues need to be addressed related to equipment maintenance and physical facilities such as development of interstate teaching and satellite programs. Diversity issues could be addressed as well, through minority and international scholarships and fellowships, especially pre-baccalaureate summer interns and graduate fellowships. Internships for undergraduates working in the USDA, and other related agencies, such as EPA and DOE could be very useful in insuring training of future work forces. Remember that our future is in students who go to college and this relates to support for research and education programs.

Land Grant Universities

30. What is the continuing role of Land Grant Universities? 1890's Colleges? 1994 Colleges?

RESPONSE: The role of the 1862 Land Grant University needs to be revisited to see if it has in fact changed from the time in which the 1862 Land Grants were initiated. Based on the results of 40+ visioning sessions with community groups of all kinds throughout the states of Minnesota, North Dakota, and South Dakota, it is evident that there continues to be a great reliance on the resources of Land Grants to provide research and education that meets practical needs in the daily lives of our citizens. Land Grant Universities need to keep focused on that basic role. We also need to take advantage of the rich cultural perspective that the 1890 and 1994 Institutions bring to the solution of many of societies problems. It behooves the leadership of the 1862 Institutions to take the lead in facilitating coordination and collaboration with 1890 and 1994 Land Grants in to the future.

The practical needs in the daily lives of our citizens needs to be stressed. Production agriculture has played an extremely important function that should not be forgotten. If the world's population doubles in the next 30-50 years we are going to have to produce more on our good land if we do not want to use highly fragile land whose use would make a big environmental insult.

31. Is the current formula used for allocating Federal funds to land grant universities fair, reasonable and does it address changing conditions? If not, how could it be improved?

RESPONSE 1: The real question in allocation of formula funding is: What is fair? What was fair in the last century is different today and into the next century. This question needs significant research because there are many ramifications. We need to look at what our strengths are and could be within land grant institutions. This is not a political issue but requires research to determine direction so that fewer research projects could pool money and then compete for declining dollars. This does not necessarily mean to give up specific state needs associated with Federal funding.

RESPONSE 2: The current formula is antiquated and needs to be revised. Among other factors, it is based on number of farms and farmers, and clearly favors those parts of the U.S. that have small farms and lots of farmers. The formula has not changed because Congressmen and Senators with positions of leadership and power like the existing formula, as it favors their constituents. It would be fair to base the formula on total acres in production and/or the cash value of the crops and animals produced in each state.

RESPONSE 3: Allocations should be based more on resource protection than on production needs to help level the playing field.

32. The land grant universities have a system of agricultural experiment stations in each state. In today's environment of Federal and state fiscal constraints, is such an extensive system of research stations still warranted (please explain)? Could certain functions be merged with other USDA agencies, other Federal agencies, etc.?

RESPONSE: The system is still warranted because the state stations are very effective in leveraging resources: they address the problems of "the people;" they are flexible, and they have access to a wider array of talent. States are now cooperating to a level where regional needs are being taken care of. For example, how many states buy slots in another state's veterinary college to avoid having to build a veterinary college. Some states are now sharing management of research stations.

33. How can agriculture research be best coordinated among Federal, state, and private institutions?

RESPONSE: A number of these questions regarding the land grant universities and the USDA Agricultural Research Service are related to the appropriate role of cooperation & coordination. We should continue to increase coordination and cooperation of the ARS and land grant systems. It would be very useful to establish a joint commission to conduct a careful facilities review much in the spirit of the military facilities review that is leading to the closing and consolidation of military bases. It seems that in many areas it has been easier (particularly for the USDA) to acquire funds for facilities than for the support of programs. In any event, an appropriate approach to the coordination of program and the consolidation of facilities could be very helpful in bringing about more effective cooperation at the facility and staff level in the two organizations. In addition, the location of ARS groups on or adjacent to campuses is a very positive synergy.

34. What models currently exist, and are in use to provide regional cooperation in research and extension?

RESPONSE 1: The Management Systems Evaluation Area (MSEA) research program is an excellent and appropriate model for use of scarce Federal funds to conduct high priority regional research, while minimizing duplication. Selection criteria for awarding these competitive grants require that MSEA sites be in different landscape/hydrogeological settings, eliminating duplication. It is regional (Cornbelt), focused on water quality (high priority), and is a partnership of many Federal and state Agencies (ARS, CSREES (research and extension), USGS, USEPA, MDA, MPCA) working together and in a successful manner. Locally it is the prime example of the joint synergism generated by University/ARS working together through the Center for Agricultural Impacts on Water Quality at Minnesota to address high priority research – each contributing without duplication of effort.

RESPONSE 2: A viable model is the one provided by the Rural Retailing project completed this Spring, 1995. The project was "born" in a brainstorming NCR session and proposed as a regional project. As a "brainchild" of the NCR group, they continued interest in the project and concluded with a national symposium at the end of the project that included 1. keynote speakers on the topic of access to goods and services in the rural community, 2. a call for research papers and posters on the topic. The research papers and poster proposals went through a blind review process. Special attention was given to the participation of extension (both in planning and publicizing the symposium) and consequently many in extension participated both in the sessions and as attendees. Time was planned for interaction of all of the attendees and many ideas were shared for dissemination as a result of this joint effort.

35. In the current era of constrained resources, is it appropriate to use Federal funds to promote cooperative regional research to reduce unnecessary duplication; and to what extent is it appropriate to use Federal funds to encourage consortia of states to establish individual centers of excellence to address common problems?

RESPONSE 1: Yes, certainly such action might assure maximum benefit from constrained resources. But the specific common problems must be addressed after assurance that they can be optimally handled in such a regional research context. With the increasing need to look globally but act locally, such consortia may not benefit all issues. Flexibility needs to be in place so that critical national issues can be addressed at the local level to avoid the concept of one-size-fits-all.

RESPONSE 2: It is appropriate to use Federal funds to promote cooperative regional research to reduce unnecessary duplication and to encourage consortia of states to establish individual centers of excellence to address common problems. It is a source of concern that there seems to be unequal sharing of financial responsibilities for coordinating regional research initiatives and that they are often not taken seriously by all the Experiment Stations involved in that regional research. Some mechanism needs to be developed that establishes fiscal responsibility by each of the states involved in a regional effort.

36. As societal concerns about natural resource use, rural development, animal well being, etc. are integrated into the USDA agenda, is there a role for "new" partnerships with the Federal sector?

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RESPONSE 1: This question needs redirection to efficiency of resource use vs. environmental insult. Production agriculture has been successful in increasing yields with minimal environmental insult. We would have to farm fragile lands with great environmental insult if yields had not increased. The best friend of the environmentalist is the agriculturist. Without our success there would be a lot more Haiti's.

RESPONSE 2: The question is, if there are societal concerns within an area of rural development, for example, are the problems in one region generic enough for application to other regions? However the role of the Federal government is not clear. What is fair in the Federal/State dichotomy? If an issue is important enough nationally, it may best not be left up to individual states. There are certain issues such as animal well being that need to be placed within Federal labs on the campuses that have access to expertise for such complex problems, i.e., engineering, physics, medicine, social science.

37. Other parts of the Federal Government sponsor research directly applicable to the food and agriculture system. The National Science and Technology Council is intended to address the coordination of related activities across agencies. How is this intended to work in the case of research and extension on food and agriculture? How well is it actually working? Are alternative methods needed?

RESPONSE: There is limited information provided to agricultural researchers and administrators on the National Science and Technology Council (NSTC). In fact, agriculture was not identified initially as part of the NSTC and one might question how effectively food and agricultural research is currently recognized and involved in the coordination process.

Agricultural research needs are not as prominent in NSTC make-up or documents regardless of the fact that 100% of the people eat food and many are interested in the wise use of natural resources.

It is obvious that there are parts of the Federal Government, other than the USDA, that are involved in food, agriculture, and natural resources research including USDA, EPA, FDA, and NIH. However, it is less obvious how such efforts are coordinated.

National Research Initiative

38. Congress authorized the National Research Initiative (NRI) Competitive Grants Program at $500 million per year. If the NRI is to be fully funded, where in the USDA research budget could money be transferred from?

RESPONSE: Block grants and formula funding will be much more effective if the political will is there to make it happen. We invest too much time chasing money at the administrative and scientist levels now.

Money could be transferred from funds saved by pursuing investigation and closing of some USDA -ARS facilities that don't meet guidelines of being national or regional in scope or are too small or out-of-date to continue. In addition, some portion of funds removed from support programs should be invested in research and education programs to assist competitiveness now and in the future. This would help shrink USDA Washington offices and the money could be transferred for program use. Special grants should be reduced to those of national concern and rewarded on a competitive basis.

39. What other options for funding the NRI should Congress consider?

RESPONSE: (Also see #38.) Look at our return on investment and contribution of food and fiber to balance payments and decide if we can afford not to make such an investment! Reductions in commodity payments could be invested in research to keep agriculture competitive and sustainable.

40. Have NRI appropriations been used to expand agricultural research or have they been used to continue existing programs?

RESPONSE 1: They have been used for both purposes. For example, one project that receives funding from NRI is a part of a larger research area that also receives funds from other branches of the USDA and NSF. On the other hand, another NRI funded project is unique and unrelated to any other. Also, research conducted with NRI funds has yielded data that then supports research applications to other branches of the Federal Government.

RESPONSE 2: NRI grants are small compared to the need and compared to the average grant size for NIH or NSF, for example, and frequently they are shorter in duration. Thus NRI often is used in combination with other funds to increase the funding to adequacy. The money is too uncertain to be used to continue existing programs and is more often used to enhance. It cannot be depended upon for long-term projects. It can be used to encourage interdisciplinary projects.

Agricultural Research Service (ARS) Laboratories

41. Should the USDA have research laboratories or should it provide competitive funding to existing entities such as universities?

RESPONSE 1: YES. Research such as water quality and global climate change benefits the entire U.S. population directly. This research can be most efficiently conducted by the Federal USDA in concert with and through the Land Grant institution for at least two reasons. First, water and air are natural resources that transcend state boundaries. The combined soil, climate, cultural systems, and topography are delineated only within U.S. boundaries as explained by the "Major Land Resource Area" concept of NRCS. Secondly, since these are National "problems," they require National coordination and leadership to address the whole research area and to prevent duplicative and competitive research efforts between states.

RESPONSE 2: USDA should have research laboratories but with the following guidelines: 1. They should be unique facilities that are not duplicated on campuses. 2. They need to be restricted to issues that transcend regions and preferably are national in scope. 3. They may bring together unique and diverse groups of scientists to address national needs such as new users. 4. They should not be labs focused on site specific or limited geographical issues. 5. It is highly preferable to be closely affiliated with research universities because of interaction with faculty and graduate students that can bring about a synergy not possible in isolated locations.

RESPONSE 3: USDA needs laboratories to fill in gaps and ensure quality long-term research. The labs also predict team building.

42. Should more ARS laboratories be co-located at land grant universities? What should be the relationship between ARS and land grant university scientists? Between ARS research coordination? How can ARS laboratory functions be more effectively linked to state Agricultural Experiment Stations?

> RESPONSE 1: ABSOLUTELY! Supported by a 1980's NRC study contracted by USDA, we know that they have close but separate missions delineated, and their location on or adjacent to campus or branch experiments stations has proven to be a positive and productive model for both ARS and programs of many universities.
>
> RESPONSE 2: Where faculties are intermingled it is better than when a USDA facility is just located on campus. They should be on campuses when possible. Integration is the best of both worlds.

43. Are ARS laboratory facilities effectively used in performing needed research? If not, please explain and offer suggestions for better use?

> RESPONSE: YES. For example, many ARS laboratory's locations on campuses are excellent models. There is a long track record of each "group" complementing the program of the other group. The water quality programs of the last 10 years and the 25-year cooperative research and extension program in waste management are but two prime examples.

Extension Service (Extension functions within CSREES)

44. The USDA Extension Service's (ES) mission is, among other things, to disseminate research results to farmers and other customers. In your opinion, is the ES effective in carrying out this mission? (please explain.)

> RESPONSE 1: Yes. Where would U.S. agriculture be without this system? The system is much more effective than given credit for. It is a successful system that blankets the country. If we did not have it we would have to create it. If we do a good job in extension we will have much better clientele support. However, it should not be business as usual. Continued adaptation is necessary. Need for integrated systems by customers brings need into focus more than ever.

45. Should the ES be involved in addressing the problems and challenges confronting urban populations?

> RESPONSE 1: Yes, but the ES mission in this era must go beyond farmers to food and environmental issues. This model is recognized internationally as the most successful among institutions. This does not mean that ES should be viewed or used in a manner that was prevalent 25-50 years ago, but needs to be comprised of non proprietary information to deliver research based educational programs to society from many parts of the land grant university. ES is not sustainable if it only addresses agriculture and the farmer's needs.

Politically we have to address urban populations and we should do it when funds are available. We need to integrate agriculture more with biology and that would start integrating rural and urban education at the primary and secondary school levels. The spinoff could be tremendous.

RESPONSE 2: The Extension Service should definitely be involved in addressing problems and challenges confronting urban populations. It should carefully choose the areas in which it is involved to be sure that there is not extensive overlap of effort with other public agencies. Creating awareness of food systems and dealing with research and education related to the environment and to the urban landscape are examples of extremely important issues that are well within the domain of the Extension Service expertise. More than half of our population lives in urban areas. For Extension not to be involved would be to ignore our land grant university responsibilities. However, Extension needs to continue to be supportive of Agriculture but it must do it differently than in the past. For example, there are many opportunities for it to collaborate with private industry in the delivery of cutting edge technical information that would establish information delivery networks. These networks would extend well beyond what Extension could deliver on its own. Sometimes Extension is the "wholesaler" and is less frequently than in the past, the "retailer". However it should not duplicate or be the lead agency in areas where other Federal agencies have more effort.

RESPONSE 3: ES should coordinate with other delivery programs to prevent duplication. It should be involved with food systems, quality of life, etc., but only where gaps exist in urban areas.

46. What, if any, role should ES play in dealing with the social issues facing farmers and rural communities?

RESPONSE: Faculty in such areas as human ecology, architecture, community planning, public health education, public affairs all have contributions to critical issues of urban and rural communities--including farmers. We have to care about what others face. Social issues are part of the rural scene and agriculture is the vehicle for economic activity. Extension should take the lead where they have expertise, but collaborate in other instances.

47. Should the ES's mission statement be changed to focus activities on production agriculture?

RESPONSE: No. (see Response #44) Production of high quality, safe food still is of vital importance so it should be primary, but social issues should be included.

48. What should ES not be involved in?

RESPONSE: Non-educational programs, social welfare programs, and regulatory or promotional programs.

Dissemination of Research Results

49. Do you have any suggestions on how USDA's dissemination of Federal agricultural research results can be improved?

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RESPONSE: It is a myth that in any decent land grant university large amounts of useful research are sitting on a shelf unused. If this happened it is most likely a problem of human dynamics rather than the delivery system. In fact the ideal would be if ARS and land grant university research could be disseminated through the ES network. This points out the reason why location of research on campus is so critical.

50. Who is, or will be, responsible for developing a marketing plan for agriculture and its science and education programs to the American people?

RESPONSE 1: This is a Federal issue of critical importance, and ARS should not be developing a marketing plan only on their behalf. This should be accomplished through a combination of ARS and CSREES rather than "every state and laboratory for itself." The undersecretary for REE should be given this mandate. We need some futuristic leaders that have the time to be creative in their positions. That seems to be less possible today than it was a few years ago.

RESPONSE 2: The marketing of science and education programs must involve linkages and coordination with programs in agencies other than with research, education, and economics. To have an effective marketing plan, there must be cooperation and coordination with USDA agencies within Natural Resources and Environment, such as Forest Service and Natural Resources Conservation Service, as well as other agencies, such as regulatory and program support agencies.

Current Research Information System (CRIS)

51. ARS uses CRIS to provide information about USDA research projects. How, if at all, do you use CRIS?

RESPONSE 1: ARS also uses the CRIS number as a budget management technique. This has lead to some inefficiencies, as often happens when program direction and administrative management use the same tool. From a research perspective, the main liability of this, is a fragmentation of progress and final report writing. A comprehensive research project can get dissected into unnatural pieces, which makes meaningful information retrieval difficult. The main attributes of the CRIS system for information about research projects, from an investigator's perspective are : 1) who or what research "Units" are conducting research in a given area; and 2) citations of their published research.

RESPONSE 2: CRIS needs serious revision and rethinking. CRIS is not a useful system unless reports are couched in lay language and then used to trigger information for the popular press or to inform public policy makers or research administrators. CRIS is not a system used for scientist-to-scientist communications. A large amount of money and time is wasted on CRIS documentation and reporting. It can be streamlined substantially.

RESPONSE 3: CRIS was outdated years ago and it needs updating.

52. In your opinion, is CRIS effective in helping you obtain information on Federal agricultural research projects? If not, what changes are needed to this information system that would provide quality data on Federal and state agricultural research? (please explain)

RESPONSE: No, although scientists have no need to know all Federal agricultural research projects, it is more important to commodity groups. Scientists identify through contact and interaction with colleagues, journals and meetings (See response to #51).

53. Is there/should there be an appropriate and adequate management information system(s) in place to report and collate from Federal investments in research, extension, and higher education sponsored by the USDA (and related research agencies)?

RESPONSE: Yes, but an improved system designed from scratch is probably required. The federal government is funding less than 10-15% of the total program. Thus the system should include recognition of this proportion of funding and not lay down mandates for the entirety.

54. Does the CRIS system and other USDA reporting systems provide an adequate accounting of the research and extension work that is being done in America?

RESPONSE: The real benefit of mission-oriented research is not accounted for in annual reports(which may be necessary in some form). However, whether or not they make a tangible difference, in this regard, there is no question of the accountability and benefit of the overall expenditure on research and extension programs.

International Relations

55. How can the USDA be most effective in the short and long term through its support of international activities?

RESPONSE: It is clear that today the United States public agricultural research sector including both the USDA and the land grant colleges represent a much smaller share of the global agricultural research system than they did several decades ago. Private sector agricultural research is also expanding rapidly not only in other developed countries but also in a number of important developing countries. This means that increasingly the U.S. must be in a position to learn from advances in other parts of the world. This objective can not be achieved by simply locating a few liaison officers around the world. It means that the USDA and land grant researchers should increasingly have the opportunity to work in laboratories, research institutes, and university research programs around the world – including other developed countries, the formerly centrally planned economies, and the developing countries. This means adopting a cooperative research perspective rather than a one way technology or knowledge transfer perspective. This expanded role for cooperative international agricultural research should be carried out not primarily to assist other countries but to assure that we maintain our competitive position in global agriculture.

56. Currently, USAID and other programs extend agriculture and agricultural development beyond the nation's borders. What continued or expanded role should USDA play in international research, education, and extension?

RESPONSE: Some of our research is increasingly dependent upon a global perspective, access to new germplasm and adaptation of new technology. Many university and ARS scientists are involved in these dimensions but usually not as a result of USDA. It is possible that USDA could play a more key role that would be widely beneficial.

RESPONSE The USAID program has been ineffective in many cases. Continuity is critical to most international activities and block grants with sunset review procedures may be more effective than the present system of long procedures and on-again off-again funding. It is easier to ignore international activities but our future requires an international perspective in a larger percent of the population.

57. What is the role of USAID in funding agricultural research and extension? Has USAID maintained support for agriculture R&D in developing countries in developing new markets for U.S. products? Should USAID contract through USDA/REE for long-term agriculture R&D?

RESPONSE Both USAID and the World Bank have substantially reduced their support for agricultural development and agricultural research. A system of international agricultural research institutes supported by the Consultative Group on International Agricultural Research has seen declines in funding in the neighborhood of 25% or more in the last decade. This decline in funding needs to be reversed. The international institute represents an important element in the global agricultural research communication system. If they did not already exist they would have to be invented. The programs should expand to include closer cooperation with the formerly centrally planned economies. As global markets respond to increased liberalization one can expect continued expansion in both agricultural exports and imports between the presently developed and developing economies. Rapid growth of income in a number of developing countries will continue to expand the demand for U.S. feed grains and meat. It would be dangerous both to the U.S. and the developing countries, however, if the developing world became overly dependent on imports from the United States. The great decrease in recent years of USAID-funded projects through land grant universities has been so significant that for all practical purposes many institutions that had significant programs in developing countries are now with few or no projects. This is not good for the U.S. or those countries. The food needs are being ignored.

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Department of Poultry Science

Date: 11-10-95	Pages: 12 (including cover sheet)
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Subject:

Message:

AGRICULTURAL RESEARCH, EDUCATION, & EXTENSION QUESTIONS FOR DISCUSSION

FEDERAL AGRICULTURE RESEARCH GOALS

1. What should be the role of the Federal Government in Agricultural research?

> Act as facilitator in coordination of goal setting, primary source of funding for basic, some funding for applied research.

2. To what extent should goal setting and goals in agricultural research be cognizant of and coordinated with research activities in the rest of the Federal research sector (HHS, EPA, DOE, etc.)?

> To some extent due to overlap in health, nutrition, food safety and environmental issues, however, majority should be improved production, processing, and marketing.

3. Is the process associated with the Food Animal Integrated Research for 1995 (FAIR '95) adequate for the development of Federal agriculture research goals? Are there goal identification processes which might better serve to enhance Federal agricultural research other than FAIR '95?

> To some extent the process is adequate. There may be better processes, however, they most likely would prove to be prohibitively costly.

4. If the process of FAIR '95 were to be used to adopt an agenda for Federal agricultural research, how would the goals identified FAIR '95 and listed below, need to be modified to address the concerns of all research stakeholders?

1) Enhance industrywide responsiveness to consumer and societal concerns;
2) Meet market demands through increased efficiency and competitiveness;
3) Develop integrated food animal management systems;
4) Maintain and enhance environmental quality;
5) Improve food quality control in terms of safety, desirability, and nutritional composition; and
6) Enhance animal well-being throughout the life cycle of food-producing animals.

> Very little change, most ag research already addresses these concerns.

PRIORITY SETTING

5. Is Federally funded agricultural research focused on the issues of highest priority for producers, processors, and consumers? If not, how can the priority setting mechanism be improved to insure that these issues are addressed?

In most cases, the priorities are acceptable. An improvement would be better integration of the food and ag industries in the process.

6. Should Federally funded agricultural research address specific technological and industrial needs? If yes, does the present system fulfill this goal (if not, please describe how this can best be accomplished)?

To some extent, yes. More focus on basic biological mechanisms is needed.

7. Does Federal agricultural research adequately address projects that result in quantum leaps in benefits, or does it dwell too much on incremental benefits?

By far, incremental benefits. Regulatory process prevents adoption of progress obtained in quantum leaps.

8. What is the appropriate role for USDA/REE in insuring competitiveness in the face of decreases in price support programs?

Encourage technology transfer and adoption of existing technology.

9. How can the appropriate Federal-State-Industry resource pools be integrated to develop high priority regional programs in research, teaching, and extension?

Receive input from the research, industry and education communities. The best ideas usually originate at the grass roots level where the situation is clearly understood.

10. How important is the Federal agricultural research role in supporting other agencies of USDA? Of other Federal agencies? Could this be done more efficiently and at lower cost?

Much of the research is already supporting other agencies, which is clearly a conflict of interest. Federal research is used in justifying regulatory positions. There must be greater objectivity from the research community at large.

11. USDA reorganization created the Cooperative State Research, Extension, and Education Service (CSREES). In your opinion, how should this newly configured agency function to support the U.S. agricultural enterprise, 1995-2002?

First, evaluate and discard traditional models if they are not effective. Or modify these models to meet needs. A big responsibility which is not necessarily popular.

12. What is the proper place for integrated systems programs? What role should the Extension Service (extension functions within CSREES) play in these programs.

Integrated systems programs will probably be the most effective manner to address the complicated research issues in the future. Extension can be good communication both to & from CSREES if allowed to.

ADVISORY BOARDS

13. Have USDA's research and extension advisory and coordinating boards been effective in planning and prioritizing agricultural research and extension? (please explain)

In some cases, yes, others, no. Too many of these boards are used to justify pre-determined agendas.

14. How have research or extension priorities been changed as a result of the recommendations of advisory boards (please provide examples)? Are there presently too many advisory boards?

Extension advisory boards have often resulted in the development of more focused, issue based programming, such as Food Safety. There are probably not too many advisory boards, but there are certainly enough.

15. What options should Congress consider to improve USDA's process for planning and prioritizing agricultural research? (I.e. how should the research agenda be prioritized?)

Input from a diverse group of industry and real consumer representatives not just advocacy groups.

16. What role should stakeholder advisory boards play in setting the agenda? What groupings should be represented on advisory boards? Con "customers" and "partners" be accommodated on one board or will it require two?

Stakeholder advisory boards are very important. Single boards are best, because customers can communicate what they want.

17. Is there a special role for advisory boards to play in international agriculture beyond what has occurred in the past?

Generally yes.

FUNDING CONSIDERATIONS

18. What is the most appropriate mix of Federally funded basic and applied agricultural research?

80% basic, 20% applied

19. How, if at all, can the effectiveness and efficiency of agricultural research be enhanced at current funding levels? At reduced funding levels?

Both questions: better cost sharing/leveraging/matching strategies involving federal, state, local, industry sources.

20. How can future funding be determined and justified so as to permit multi-year programs to be completed?

Identify a specified $ segment for multi-year programs much like the current process.

21. In view of the growing emphasis on greater accountability of Federal expenditures, do you have any suggestions as to how agricultural research results can be measured and their impact evaluated? Is there some standard of accountability for efficient and effective use of Federal research funds?

Measurement of results and impact evaluations can be built into the project cost, however, it reduces the available resources. A single standard of accountability is not practical due to the different nature of projects, some of which have economic as well as other benefits.

22. What is the proper balance between in-house, formula funds, competitive grants, and special grants?

Reasonably good as it currently exists; probably should increase competitive, reduce in- house.

23. What guidelines should be used in determining appropriations for "specified programs" in research education and extension?

Societal benefit, Economic Impact

24. Should Federal funds be used for programs only, or for facilities as well? If for facilities, how should they be allotted - competitive proposals or other? Is there a place for regionalizing research, increasing competitive grants, etc.?

Some federal funds should be allocated for facilities, both new and renovations, based on priorities set/needs identified. Allocation should be by competitive proposals. Regionalized approaches are sound in some cases.

25. Is there a place for partnerships not only with state and local public sector organizations and industry; but also with private foundations?

Yes; Absolutely.

26. To what extent do self-assessed "check-off" fees on commodities provide resources for research and education? Do these/should these programs support long-term research, as opposed to short-term product development and promotion research?

Some commodities do very well. They should support, to a lesser extent, some long term research. The key is to maintain the mission oriented approach.

DELIVERING AGRICULTURAL RESEARCH

27. In order of priority, what would be the most significant actions USDA could take to improve its management and/or delivery of agricultural research?

Establish some means of allowing "ownership" of technology by private sector. There is a precedent for knowledge to become public domain, which often prevents adoption of technology. We exist in an economic system where technology has value.

28. What options should Congress consider to improve the delivery, results, and benefits of Federally funded agricultural research?

Allow the economic system to function in "ownership" of technology by private sector through such agreements as licensing, etc.

29. What should be the Federal role in insuring training of future work forces for the food and fiber needs as well as the natural resource concerns of the public?

This is not a federal responsibility although some resources are currently federally held. It is a state and local issue, which is market driven.

LAND GRANT UNIVERSITIES

30. What is the continuing role of Land Grant Universities? 1890's Colleges? 1994 Colleges?

The initial charge -- Teaching, Research, Extension -- is still valid. We need to remember it, be reminded from time to time. Perhaps we can do a better job of integrating new clientele groups, where we have the capability.

31. Is the current formula used for allocating Federal funds to land grant universities fair, reasonable, and does it address changing conditions? If not, how could it be improved?

To a large extent, it is fair and reasonable. Changing conditions should be recognized better at the local level. It is a matter of communication.

32. The land grant universities have a system of agricultural experiment stations in each state. In today's environment of Federal and State fiscal constraints, is such an extensive system of research stations still warranted (please explain)? Could certain functions be merged with other USDA agencies, other Federal agencies, etc.?

The agricultural experiment stations still work best when housed in universities because of the key role they play in effective education of students merging these functions with other agencies would not prove to be the most effective for long term benefits, even though it is tempting for short term economics.

33. How can agriculture research be best coordinated among Federal, State, and private institutions?

> As it currently exists, it has resulted in the most envied food system in the world. Not broke/don't fix it. Allow the natural process to continue to make progress.

34. What models currently exist, and are in use to provide regional cooperation in research and extension?

> Projects, IEG, Consortia.

35. In the current era of constrained resources, is it appropriate to use Federal funds to promote cooperative regional research to reduce unnecessary duplication; and to what extent is it appropriate to use Federal funds to encourage consortia of states to establish individual centers of excellence to address common problems?

> Sometimes the catalyst of Federal funds is necessary. It is the only way to ensure outcome.

36. As societal concerns about natural resource use, rural development, animal well being, etc. are integrated into the USDA agenda, is there a role for "new" partnerships with the Federal sector?

> USDA w/HHS, EPA, FDA are the most likely partners and will function better if they work together. External partnerships w/the private sector are also useful.

37. Other parts of the Federal Government sponsor research directly applicable to the food and agriculture system. The National Science and Technology Council is intended to address the coordination of related activities across agencies. How is this intended to work in the case of research and extension on food and agriculture? How well is it actually working? Are alternative methods needed?

> This will probably work regarding food and agriculture, still early to really assess how well it is working.

NATIONAL RESEARCH INITIATIVE

38. Congress authorized the National Research Initiative (NRI) Competitive Grants Program at $500 million per year. If the NRI is to be fully funded, where in the USDA research budget could money be transferred from?

ARS seems a likely source of this initiative.

39. What other options for funding the NRI should Congress consider?

Few other options are available without detracting from competitive funding sources, which is not the best approach. Most competitive funding is the best approach.

40. Have NRI appropriations been used to expand agricultural research or have they been used to continue existing programs?

Existing Program support seems to have been the trend.

AGRICULTURAL RESEARCH SERVICE (ARS) LABORATORIES

41. Should the USDA have research laboratories or should it provide competitive funding to existing entities such as universities?

Some USDA laboratories are effective, some are less so. This seems to be at the whim of political pressure. This funding could be more effectively used as competitive funding.

42. Should more ARS laboratories be co-located at land grant universities? What should be the relationship between ARS and land grant university scientists? Between ARS research coordination? How can ARS laboratory functions be more effectively linked to State Agricultural Experiment Stations?

Absolutely, more laboratories should be co-located at universities. Relationships, between ARS and university scientists should be as collaborators, research, teaching, and student advising. I suppose some coordination is necessary but can be counter productive. Effective linkage would be accomplished by co-locating preferably in the same physical facilities.

43. Are ARS laboratory facilities effectively used in performing needed research? If not, please explain and offer suggestions for better use?

In most cases, yes.

EXTENSION SERVICE (EXTENSION FUNCTIONS WITHIN CSREES)

44. The USDA Extension services (ES) mission is, among other things, to disseminate research results to farmers and other customers. In your opinion, is the ES effective in carrying out this mission? (please explain).

In some cases they are effective, in others less successful. Most poultry industry contact is at the specialist level rather than through county based programming.

45. Should the ES be involved in addressing the problems and challenges confronting urban populations?

Where it is possible, yes. Master Gardeners, Food Safety, Nutrition, and other Technological issue education needs such as irradiation, biotechnology, etc.

46. What if any role should ES play in dealing with the social issues facing farmers and rural communities?

Probably the key is to assist w/communication involving the urban community.

47. Should the ES's mission statement be changed to focus activities on production agriculture?

Absolutely Not. Suicidal concept for ES.

48. What should ES not be involved in?

NASA (can be involved in everything involving food science and agricultural education except rocket science). (This is the only opportunity for humor.)

DISSEMINATION OF RESEARCH RESULTS

49. Do you have any suggestions on how USDA's dissemination of Federal agricultural research results can be improved?

Better contact with the industry and public.

50. Who is, or will be, responsible for developing a marketing plan for agriculture and its science and education programs to the American people?

Probably ES at the local/ state level if they are doing their job properly.

CURRENT RESEARCH INFORMATION SYSTEM (CRIS)

51. ARS uses CRIS to provide information about USDA research projects. How, if at all, do you use CRIS?

Very minor use.

52. In your opinion, is CRIS effective in helping you obtain information on Federal agricultural research projects? If not, what changes are needed to this information system that would provide quality data on Federal and State agricultural research (please explain)

CRIS is not effective for my use. It should be made more user friendly which would encourage better use outside the Federal System.

53. Is there/should there be an appropriate and adequate management information system(s) in place to report and collate results from Federal investments in research, extension, and higher education sponsored by the USDA (and related research agencies)?

This is probably highly desired by Congress and the Administration. It is often a costly process and often self serving in nature.

54. Does the CRIS system and other USDA reporting systems provide an adequate accounting of the research and extension work that is being done in America?

Generally, yes.

INTERNATIONAL RELATIONS

55. How can the USDA be most effective in the short and long term through its support of international activity?

> Assist US marketing firms to understand the strengths, weakness and barriers to effective international trade.

56. Currently, USAID and other programs extend agriculture and agricultural development beyond the nation's borders. What continued or expanded role should USDA play in international research, education and extension?

> A very cautious role. We educate the competition and then have to compete on a less than level playing field.

57. What is the role of USAID in funding agricultural research and extension? Has USAID maintained support for agriculture or has the agency moved away from agriculturally related programs? What is the role of long-term agriculture R&D in developing countries in developing new markets for U.S. products? Should USAID contract through USDA/REE for long-term agriculture R&D?

> If is partially true that the agency has moved away from related programs. There has been limited success in developing new markets; we mostly help them get better at producing with small degree of attention to marketing. The key is, even if markets are developed, how do they pay the price? One alternative would be for USAID to contract through USDA/REE, although the implications are uncertain.

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31 October 1995

The Honorable Pat Roberts
Chairman, Committee on Agriculture
1301 Longworth House Office Building
Washington, DC 20515-6001

Dear Chairman Roberts:

In your letter of 12 July you stated that investment in agricultural research is vital to a strong farm economy. We fully concur. We are the Council of Scientific Society Presidents (CSSP), the national science policy center of a consortium of presidents of scientific professional societies covering over 100 disciplines and with a total membership of over 1.5 million scientists.

Your accompanying 57 questions are very important and perspicacious, and address five primary areas:

Establishing National Goals
Setting Research Priorities
Funding Research
Doing Research
Delivering Research Results

We appreciate your consultation with the key stakeholders of the science research community in your quest to assure that America's world class science research community exercises its unique talents most wisely and effectively.

We here enclose for your consideration some of our perspectives and recommendations on effective policy in these five areas, based on both historic policy of the CSSP and reflections on the 57 questions.

INTRODUCTION

Agricultural research pursuant to the Farm Bill of 1995 should be defined to encompass all of the research that is relevant for the overall agriculture and food sector. This means it should include all the research relevant to the production and management systems for agriculture, the food production system including ~~nutrition~~, and the environmental, economic, and rural life factors ~~that relate~~ to the agriculture and food system. For simplicity, we term ~~this~~ agricultural research.

Our focus is on foundational research for this broad agriculture, food, and

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environment sector. Foundational research is fundamental research that serves as the basis for either additional fundamental research cr future applications.

Agricultural research is funded and conducted by three main entities: federal agencies including extramurally-funded research, state agencies (mainly universities), and the private sector. Our primary interest in this letter is the federal responsibility in relation to the 1995 Farm Bill. We believe the focus for federally-supported agricultural research should be foundational research; research of national scope and impact; research needed by other federal agencies for their missions; research of a scale and magnitude beyond the usual capacity of other research entities; and federal extramural funding.

ESTABLISHING NATIONAL GOALS

Over a dozen studies have concluded that the economic payoff of federal investment in agricultural research has been immense when assessed over multi-decade periods of time. The internal rate of return on each dollar originally invested is 15-50 cents per year, with an added secondary rate of return nearly the same size. Rates of return so high indicate an economic inefficiency; that is, a historic underinvestment by the federal government in foundational agricultural research.

The purposes for agricultural research established in the 1990 Farm Bill are suitable for continuation for they very appropriately embrace the entirety of the agriculture, food, and environmental sector.

In addressing these purposes, the federal government should have six inextricably linked major roles:

- First, to champion the sources and systems of discovery and innovation in all science domains related to agriculture to ensure the US continues world leadership)
- Second, to strengthen and build the capacity of US agricultural innovation sources, systems and processes as the critical key to sustained national strength and economic growth in a rapidly shifting worldwide economy.
- Third, to assure adequate growth and consistent development of support for US long range foundational agricultural research.
- Fourth, to vigorously lay the foundations for a defined, dynamic, better US future in all outcomes related to agriculture.
- Fifth, to assure the Nation has an evolving, comprehensive, strategic agricultural research plan that addresses the most important issues of the national future.
- Sixth, and very importantly, to fund and conduct research for agriculture that is nationally relevant, addresses major national needs, contributes to a sustainable agricultural

economy, and is both generic and foundational for furthering innovation and national goals.

We reaffirm that overarching goals for the Nation are the role of the American people, as expressed by their elected leaders, the Congress and Administration.

The federal government must address and ensure for the Nation a robust long range foundational agricultural research enterprise and its supporting systems: a superb research university system, effective technology/knowledge transfer systems, and an unrivaled scientific workforce.

To fulfill these roles, we believe certain **fundamental principles** must apply to all aspects of foundational agricultural research, from setting priorities through delivering results. These principles include:

- Use overall sustainable agriculture as the basis for considering all research for agriculture.
- Fund research through competitive awards based on merit reviews by qualified experts, where the criteria for evaluation are the quality and prospect of the ideas and their relevance to agricultural missions.
- Use funding systems that are maximally open to all qualified scientists who wish to participate in research for agriculture.
- Set priorities for federally-funded research consistent with the research having major probability of conferring significant, long-run national value.
- Emphasize foundational research: Research that serves to lay foundations for either further fundamental discovery or future application.
- Use a "bottom up" strategy in identifying needs and setting research priorities.
- Ensure focus on critically important issues through unified, strategic research and application plans.
- Reestablish by word and deed the "culture of connection" between the doing of research and the extending of research.
- Recognize that US research relevant to its agricultural sector is oftentimes also closely relevant to international food security and nutrition.
- Get Congress out of micromanaging research through earmarks and out of funding special grants and other projects initiated through the appropriations process.

SETTING RESEARCH PRIORITIES

"Basic" and "applied" research are distinctions without a difference: the research itself may be indistinguishable except for the motivations of the researchers. We will here use the term "foundational research" throughout to convey that the scientific discoveries made serve to lay foundations for either further fundamental discovery, or application to practical ends, or both.

Specific research goal setting and research agendas are not best set by the federal government. The role of the federal government is to facilitate these processes. The expertise and insights of the science community and other key stakeholder communities are the best resources for setting research agendas. It is the role of the federal government to recognize and effectively utilize these external resources.

In addition to the fundamental principles, additional emphases should apply to setting research priorities. These include:

- Set priorities for federally-funded research consistent with conferring significant, long-run national value, e.g., confidence in the quality of the research because it has survived rigorous merit review by qualified sciences and representing federal responsibilities.

- Emphasize research that extends outward from current limits of knowledge into the next frontiers, unknown territories, and uncharted paths.

- Use a "bottom up" strategy in identifying needs and setting priorities; utilize stakeholders and research users in proposing research priorities, and support researchers in identifying the highest priority research questions.

- Ensure focus on critically important issues.

Your many questions on this area appear to indicate a veiled assumption: priority setting should be top-down, dispensed from the US Department of Agriculture (USDA). We respectfully disagree.

All agricultural research is focused on someone's highest priority all the time. The question is: whose priorities should prevail and ultimately how can we be more objective?

Commodity groups and food-animal groups define priorities by the most lucrative growth markets and most rapidly attained products or improvements on products that provide a competitive edge in those markets. The success of the short-term business priority model depends on the depth and breadth of pre-product foundational research available from which to draw solutions; it cannot succeed alone on a sustained basis unless that research is available. Thus it is clearly very unwise policy to make them the primary driver of federal research priorities. To the extent that advisory boards for agricultural research are heavily based on business interests as advisors, their role needs to be focused on definitions of the challenges and recommendations, not decisions, and on long term (10-15 year) perspectives, not quick fixes.

Government officials and many research managers see research priorities as territorial definitions and their roles as top-down direction setting. The actual foundational researchers are most successful when ignoring and disrespecting enclosures around their thinking or territorial boundaries in their research, when they are exploring the edges of knowledge. They seek to imagine, to discover and to innovate, to define and solve highly complex problems. They work from the frontiers of what is known into terrain with no prior footprints. They can see what can be done and what areas of knowledge are most open to expansion. Their expertise is more current and their imagination more freely evident than most senior government officials, long removed from the frontiers of world class research.

We thus suggest that a bottom-up decision strategy for priorities will ultimately be more successful, and that the USDA should continue to be committed to utilizing the vast and deep expertise of the Nation's science research community, even more than previously, and certainly as the dominant priority setters for scientific research.

The CSSP would be pleased to help the Congress and the USDA by developing a list of 100 important unanswered research questions as part of the process of developing each 5 year Farm Bill.

A current problem is that each of the many USDA advisory groups sees similar situations from different perspectives. Regular cross-communication among them to all the others before their recommendations are adopted or otherwise integrating their advice giving processes and people is productive. We also need to ensure against tedious or over-prescribed processes that result in excessive delay of progress or even increase the unmet need for more agility. The primary impediment to research agility in the USDA is the history of excessive micromanagement of the USDA by Congress, which slows down all decision making and undermines any willingness of senior research directors to take the kinds of prudent risks, some of which will fail, that university-based research directors take all the time.

All research has a common purpose: to find out what we do not yet know, but want to know. Well designed research programs of national scope should connect to the overarching national goals.

Setting research priorities can be done very effectively by the science community as in the USDA's National Research Initiative (NRI) and also in the Sustainable Agriculture Research and Education (SARE) program: leading researchers of the scientific community, with input from stakeholders, determine what is possible, most likely to succeed, and of highest priority.

The NIH model sets clear priorities by diversified groups of frontier, leading experts conducting peer-review among competing ideas from across the science community. The NSF model uses the scientific community as the exclusive priority setter and these priorities evolve as rapidly as the new knowledge requires it to. Scientist-based prioritization models win Nobel Prizes and lead to dramatic progress. Persistent success depends on the agility and flexibility in the priority setting process. Both of these models are positively relevant to the agricultural research sector.

Business R & D models define priorities as the most lucrative growth markets and most rapidly attained products or improvements on products that provide a competitive edge in those markets. The success of the short-term business priority model depends on the depth and breadth of pre-product foundational research available from which to draw solutions; it cannot succeed alone on a sustained basis unless that research is available. Thus, it is clearly unwise policy to make short-term business demands the primary driver of priorities. But, it is indeed wise to ensure U.S. business interests ready access to new knowledge and implications of new discoveries and to ensure a continuing, iterative long term dialog with the research community to increase the probability of effective connection.

The Nation has an excellent, world leading fundamental research capacity in its top doctorate-granting universities and an excellent technology application capacity in its businesses. The middle range of research entities and innovation and connection systems are not as well developed. An unmet national priority is to study these mid-level connection systems, develop and test many alternative models to improve them and support the models that work best over the long term.

CSREES (the recent unit created within the Department of Agriculture to be the Cooperative State Research, Education, and Extension Service) and its partnerships with state universities and colleges (Land-Grant and related institutions) is part of that innovation-connection enterprise that brings together the fruits of research with the stakeholders who will use it and can bring new ideas for research challenges across the nation's state research communities. Directions that should improve its success over time include further integration of its functions; further enhancement of communications; and ongoing exchange of its people with top research universities.

FUNDING RESEARCH

In addition to the fundamental principles, additional emphases should apply to funding research. These include:

- Emphasize foundational research to the fullest extent practicable.
- Apply enough funding to program areas and specific projects and for sufficient duration to make a real difference.
- Sustain the scientific culture that increases the probability of "quantum leap" research.
- Encourage leveraging of research resources, but recognize the key role of federal leadership in funding nationally-relevant fundamental research.
- Get Congress out of micromanaging research through earmarks and out of funding special grants and other initiatives inserted into the appropriations process and related venues.
- Apply federal funds to national issues.

The relative roles of industrial or federal funding for this approach should be seen as a spectrum of attributes that indicate primary sponsorship, not an absolute black or white issue. When the research addresses a national problem, has a long-term, too high a risk, or requires too large a size of investment to be likely to achieve a single business sponsor, it becomes a federal role to help the Nation. If the research has a short-term focus, addresses a local or regional problem, is a reasonable business risk, or is of a size likely to achieve a single business sponsor, it is not the federal role to support it. Thus, it is not an issue of the government picking winners nor providing corporate welfare but of how best to support the national interest.

To achieve the desired objectives for focusing agricultural research on national goals and on foundational research a number of steps should be undertaken during the next 5-10 years, including:

- The fraction of the USDA budget devoted to foundational research should increase steadily in order to achieve the new knowledge needed to ensure world leadership for the Nation and provide the Nation its high rate of return in the Gross Domestic Product (GDP).
- All increases in research funding from FY 1997 forward should be directed to university-based, peer-reviewed, investigator-initiated, extramural competitive grants of 3-5 year duration.
- Multidisciplinary research programs and projects should receive appropriate emphasis for the complexity of the priority needs and research questions and funded sufficiently to ensure good research progress.
- All internal USDA research should be shifted during the next 5 years into extramurally peer-reviewed competitive grants, with 5 year maximum renewals. All active USDA researchers should be encouraged, even required, to take brief sabbatic leaves every five years to conduct foundational research in top university laboratories.
- Minimum standards for retention and promotion of USDA research staff should match those for retention and promotion at the top research US universities.
- As a general proposition and to the extent feasible and cost-effective, resource allocations should be directed from the USDA to university-based foundational research that has been merit reviewed by expert peers.
- Robust knowledge and technology transfer systems for capture of foundational research into commercial value should be established as standard operating policy.
- A zero-base budget should be established every decennial census year for all USDA research funds.
- All Congressional earmarks and special grants should be eliminated.

Too much of the federal agricultural research is not subject to the processes that make for quantum leaps: project ideas initiated by frontier research leaders, regular and rigorous peer review, multiple working hypotheses, a national culture that strongly encourages unique and unusual agricultural research ideas, and accountability for resource use in short increments.

Among the most important breakthroughs in agriculture in the last quarter century were the first genetic engineering processes, all of which grew out of federal funding at Land-Grant universities that met the above criteria, but which, ironically, were not funded by federal agricultural research appropriations (to the Department of Agriculture) until the quantum leap was already taken.

One of the largest disincentives to breakthroughs and quantum leaps is Congressional affection for earmarks: scientists whose lack of boldness, poor track record of new ideas, and lack of imagination and originality have failed merit review have sources of research funds through direct Congressional intervention that not only circumvent rigorous merit review but also take money out of the hands of those successful in the peer-review process. These earmarks send the message to new scientists year after year that it is not the merit of ideas or accountability for results that makes one successful, but whom you know. The idea of taking risks on new ideas is being replaced by too much caution. Repair of the last decade of Congressionally-established iatrogenic damage will take a decade to recover if we start now; if we do not stop, we will decline even more.

The most important role for Congress and the USDA in ensuring competitiveness as price supports decline may be to stop looking for quick fixes and focus on increased support of imaginative merit-reviewed foundational research. The private sector will need a wide variety of discoveries and improved innovation systems to create higher value. If the past is any guide, many of these discoveries and innovations are the kinds which we might not even be able to imagine for several years. Setting rigid directions, or pushing private sector demands too soon may limit the direction of research imagination and decrease the chances of success.

DOING RESEARCH

In addition to the fundamental principles, additional emphases should apply to doing research. These include:

- Provide fullest possible access to the agricultural research system by all qualified investigators, irrespective of institution.

- To the fullest extent possible, ensure research is conducted by most qualified investigators with best ideas and best records of and prospects for success. This is most efficaciously accomplished through rigorous peer-driven merit review for quality and relevance.

- Recognize the multidisciplinary complexity of many of the key research questions in the agricultural sector and ensure that research can be in settings that provide for appropriate proportions of multidisciplinary research.

- Do research in symbiotic relationships with potential extenders and transferrers.

- Ensure national capacity and vitality for continuing long-term, basal studies, including genetic, physiological, environmental, and ecological studies and analyses. Without such studies it will be virtually impossible, for example, to ensure adequate quality of soil and water resources for sustainable agricultural systems.

- Recognize that US research for its agricultural sector is oftentimes closely relevant to research necessary for international food security and nutrition. Conduct the research and establish programs that will forge the optimum linkages between the US agricultural research sector and the international research sector and the constituent national agricultural research systems.

- Expedite knowledge and technology transfer—to major national and supra-state needs, focusing on those of highest priority

It cannot be emphasized too strongly that research for the agriculture, food, and environmental sector should be done by those persons with the best ideas, strongest proven records, and most demonstrated promise—irrespective of their universities or research entity affiliations. Federal funding, through the USDA and otherwise, should be available to them and to all qualified scientists on the same merit-based competitive basis. This is the principle of quality and openness which is the guiding characteristic of the NSF and NIH systems, which most careful observers believe to be the heart and genius of the American federally-funded research systems.

Foundational agricultural research is both fundamental and an intimate mixture of both fundamental and mission-oriented/linked research and development. It follows from NRI legislation that this mixture is also appropriate for agricultural research.

The major roles of Land-Grant universities for research, and extension, for agriculture, should be assured, indeed even increased in various ways such as with further emphasis on federally funded foundational research. But, it also follows that research for the sector need not be done only at the Land-Grant universities with their time-honored and broadly effective research programs. There should be systems and policies established, including provision for federal funding, for further participation by non-Land-Grant universities in such research.

It follows that extramural funding for the research should, in the main, be allocated through competitive processes using peer-driven merit review processes where the criteria are (i) quality, (ii) prospect for success, innovation, and advancement of knowledge, and (iii) relevance—broadly defined—to the missions of the USDA.

Universities are exceptionally fertile places for conducting research. Indeed, careful observers regularly conclude that the genius of the American research enterprise is the American "research university." Land grant universities are, to a large extent, research universities. Research of highest quality is not limited to them, of course. Exceptional research is also done at private and other public universities, and these should have greater access to federal funding for foundational agricultural research than at present.

Land-Grant universities, and their colleges of agriculture and cognate units (schools/colleges of human ecology, forestry and/or natural resources, veterinary medicine and similar units), should be nourished and supported. Their research must also be increasingly subject to the same standards of external peer-driven merit review as characterizes the rest of higher education—and relevancy to the USDA missions, akin to the NIH model of mission relevance.

The current formulae for distributing the so-called formula funds is now out-of-date because of the major demographic and economic shifts that have occurred since it was last established. If formula funds are to be maintained as a component of federal policy, a major initiative of the 1995 Farm Bill should be to revisit the formulae used for allocating formula funds to bring the formulae into closer alignment with major needs of direct federal interest, perhaps with the help of the National

Academy of Sciences' Board on Agriculture.

Federal agricultural research facilities and federal funding in support of facilities raise a particularly challenging, and interesting, set of issues. All decisions regarding this should be based on demonstrated quality, need, and cost-effectiveness. Effectiveness of ARS facilities should be subject to peer-driven merit and relevancy review, especially as there is likely to be an initiative to close or convert ARS facilities.

Without any doubt, a comprehensive system of federal and state laboratories, experiment stations, and field study sites is highly desirable throughout the country given the extraordinary range of physiographic, climatic, and productivity characteristics of the Nation. An intensive effort should be made to identify the optimum set of state and federal facilities which serve supra-state and national needs. Consideration should be given to creating multi-state, agroecological regional facilities to serve the interests of major agroecological zones of the Nation.

A key issue is the extent to which federal funds should be used to support facilities comparable in purpose and function to those of the state and private sectors. There is a value in cost-effective redundancy, but much caution should also be exercised. This will be especially important should the Congress and Department proceed to evaluate facilities as contemplated by the 1990 Farm Bill and more recently by the Administration.

As a general proposition, it is reasonable to consider co-locating major research facilities and scientists--whether federal or state--in the same location because there is a significant value in having a wide range of colleagues for collaboration, stimulation, and assistance. In general, there will be more advantages in locating federal scientists and facilities at state Land-Grant universities, than not.

ARS laboratories should convert to become primarily funded on a competitive basis deriving from peer-driven merit and relevancy review over a reasonable period of time (such as five years). To put principle as question: Why should not federal scientists receive funds and be rewarded by the same general standards as scientists throughout the Nation as a whole?

It is of course appropriate to use federal funds to encourage coordination. Carefully constructed cost-effectiveness tests must be applied, including using criteria based on economic efficiency and scientific quality. Coordination of the federal, state, and private sectors is value when it serves useful purposes of enhancing resource deployment, quality and pace of securing research findings.

Since a variety of effective models exist, lessons should be drawn from them to help optimize coordination. One of the earliest "recent" models is the Pacific Northwest consortium of Land-Grant universities, ARS, and NRCS (Natural Resources and Conservation Service) scientists to deal with soil, water, and productivity issues on a regional ecosystem basis. The dairy-forage clusters and integrated pest management are two others. Regional research projects are effective but they are usually underfunded.

A sensible way to increase coordination--and, importantly, to expedite knowledge and technology transfer—would be to define major national and supra-state needs, focus on those of highest priority (using urgency of issues as a major weighting factor), and proceed to develop **unified strategic research and application plans** for both major research areas and also for key, urgent contemporary issues. (These issues include such areas include biological and integrated pest management, ecosystem-based sustainable agriculture production systems, new uses and products, optimizing animal production systems, rural economic vitality and vulnerability, and agroforestry systems.) From these plans, viewed broadly, and in the context of agroecological zones, effective means of coordination can be established. Transaction costs can be substantially higher for this higher level of coordination, and they must be provided for to have effective coordination.

International agricultural research represents a special opportunity for the US agricultural research system. This is particularly true because increasing indigenous food security throughout the world is the first key to stabilizing both population and democratic political systems and for laying the basis for subsequent economic development for US overseas markets.

Lest the US suffer the consequences of being insufficiently supportive of food security interests worldwide, we need to provide sufficient resources to develop political stabilization and democratization worldwide. The situation is made all the more important for US interests because G-7 competitors are steadily expanding their multilateral research funding.

A multi-part program should be seriously considered for establishing in the 1995 Farm Bill to link, through an ongoing federal mechanism, US-based researchers with international agricultural research centers (IARCs) and the national agricultural research systems (NARSs) for developing countries. The program should have several key elements: (i) obligatory participation and partnership with the IARCs and NARSs; (ii) bona fide significant commitment by the US-based scientists and institutions; (iii) awards through peer-review; and (iv) regular evaluation for merit and relevancy. Awards should be for up to 5 years, with opportunities for continuation based on competitive awards of peer-reviewed progress and renewal proposals. Support for NARS and IARC personnel visiting and studying in US laboratories and fields should be provided, and also for US scientists doing work in foreign countries.

A study to examine the synergistic interests of USDA and USAID might be commissioned in the 1995 Farm Bill.

DELIVERING RESEARCH RESULTS

In addition to the fundamental principles, additional emphases should apply to delivering research results. These include:

- Reestablish by deed and word the "culture of connection" between the doing of research and the extending of research.

- Modernize the concept of extension to include technology transfer in the industrial sense and knowledge transfer in the human and community sense. Sustain the cooperative principles involving researcher-extender/transferrer/user, but modernize and renovate them to fit the variegated contemporary settings.

- Make operational the culture of connection by reaffirming existing programmatic ties and establishing new mechanisms. Examples include involving extenders in multidisciplinary NRI grants (as permitted **and provided for** by the enabling legislation and NRC report, Investing in Research) and by establishing **unified strategic research and application plans** for major contemporary issues.

- Be more effective in establishing research and application plans by more intimate and iterative (and interactive) involvement of stakeholders and users in preparing the plans and overseeing their implementation.

There are several high priority actions that should be taken for improving the quality, management, and delivery of research for the agricultural sector. Research should be connected more closely to application of research results through (in the FY 1997 budget) **national unified strategic research and application plans for high priority topics**. Research programs should provide knowledge relevant for establishing long-term sustainable agricultural production systems for the Nation. The role and use of stakeholders and user communities should be increased in formulating research and application plans akin to that used for the SARE program established in the 1990 Farm bill. Very significantly, Congress should stop micromanagement of research programs; rather, Congress should set goals and then monitor and evaluate progress toward them.

The federal government has a critically important role in ensuring the training of future work forces, especially at the post-graduate level, because doing so is a major national need, not amenable to capture mainly by states or the private sector. Cooperative programs of funding are appropriate and should be established. Roles for Congress should include providing incentives for involving graduate students on research grants; sustaining and expanding the fellowship program; and providing sufficient amounts of funding for fellowships and grants.

The institutional-strengthening and capacity-building programs of the NRI should be enhanced.

The Extension Service (ES) and Cooperative Extension (CE) have been effective in disseminating research and providing major support for the development and advancement of the US agricultural sector. The characteristics of the "user community" and of the problems, issues, and research results are now very different than previously, created unprecedented new conditions for extension. New models for extending knowledge and technology are rapidly emerging. An analytical study commissioned in the 1995 Farm Bill on how best to most effectively deliver research-based knowledge and technologies would be a productive option.

Whether or not ES (or CE) should be involved in serving urban populations is a particularly interesting and vexing challenge. Given the major needs for and benefits of adequate nutrition for children, major priority should be given to major expansion of EFNEP (the Expanded Food and Nutrition Education Program), especially by directing it at middle school children.

All components of the agricultural sector can benefit from the expertise and attention by ES (CE). Thus, the ES mission statement should focus on farms and farming, rural communities and people, food and nutrition, and the sustainable agriculture and infrastructural issues. The Extension Service (and CE) should more formally and systematically extend to incorporating researchers and research results of the Agricultural Research Service.

The CRIS (Cooperative Research Information System) is valuable and useful, and a CRIS-type system is very much needed. CRIS provides especially useful information, virtually invaluable in planning, priority-setting, and characterizing and understanding the agricultural research system. But, information technologies applicable to CRIS and user communities are rapidly changing. A major study should be done to determine how best to ensure that CRIS takes full advantage of these technologies and also adds output-based information to its extensive use of input-based information. The survey should be based on user and potential-user needs and should continue its iterations until a high level of user satisfaction is achieved.

Sincerely yours,

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23 October 1995

Dr. John Goldberg
Committee on Agriculture
U. S. House of Representatives
RM 1301 Longworth House Office Bldg
Washington, D. C. 20515-6001

Dear Dr. Goldberg:

Enclosed please find the responses from the Society of Nematologists to the Committee's questionnaire on Agricultural Research, Education, and Extension. As scientists and educators concerned with an important group of plant pathogens (please see the enclosed brochure) we are extremely concerned and anxious about the actions being considered by the Federal government with regard to agricultural research, education and extension programs. Our responses represent a consensus from several eminent scientists.

We are concerned about the paradox that something as vital to our economic well-being as agriculture is actually one of the most vulnerable targets as budgets are cut. We think this situation exists because of pervasive and fundamental ignorance of how little we pay for the safest and most abundant food supply in the world. At a time of national economic difficulty, it is critical for people in the United States to realize how important it is that we pay only a fraction of our income for food compared to people from other countries. This fact has enormous implications for our standard of living and the amount of money available for other private and public purposes. Viewed in this context, agriculture is indisputably one of the outstanding strengths of our economy. Similarly, our level of agricultural productivity is perhaps one of the best examples of benefits that can accrue from public-private partnerships.

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Nevertheless, politicians and reporters increasingly refer to agricultural endeavors as examples of government waste and abuse. Several times recently, we have heard politicians and seen news commentaries saying things like "USDA gives a half-million dollars to scientists to study a fungus on blueberries". Obviously, the vast majority of people are outraged when they think that tax money is being wasted on such apparently frivolous activities. However, without a great deal of education, I believe that those sorts of techniques will be used very effectively to make investment in agriculture one the most attractive and vulnerable targets for down sizing government.

Investment in agriculture has had a profound effect on our economic well-being for more than 100 years and we continue to reap benefits. Today, our economic problems would be immeasurably worse if we paid 25-30% of our incomes for food and did not sell so many agricultural commodities abroad. Advances in molecular biology have put us in a position to realize even more remarkable opportunities. However, producers face increasing competition for markets resulting from expanded trade agreements. They must compete for water, land, and other resources with urban residents. They must satisfy increasing concerns about safety and pollution. For producers to remain competitive in the face of these new challenges will require at least as many resources be invested in research and development as we have invested throughout our modern history. We have clearly benefited from investment in the past and we would be foolish not to continue to do so.

Sincerely,

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AGRICULTURAL RESEARCH, EDUCATION, AND EXTENSION

Questions for Discussion

RESPONSES PROVIDED BY THE SOCIETY OF NEMATOLOGISTS

Federal Agricultural Research Goals:

1. What should be the role of the Federal government in agricultural research?

The Federal government must have a multi-faceted role in agricultural research by providing resources and setting priorities necessary for agricultural research to facilitate the resolution of immediate problems hampering the reproductivity and quality of food and fiber as well as ensuring a healthy environment. In addition, fundamental research should be supported to provide an information-base to provide innovative solutions for future problems facing agriculture and humanity. Other important roles include fostering communication and collaboration among researchers, and to provide encouragement and support for educating graduate students and post-doctoral scientists. If the US does not remain a world leader in agricultural research, will it one day face the situation of not being able to feed its population?

2. To what extent should goal-setting and goals in agricultural research be cognizant of and coordinated with the research activities in the rest of the federal-research sector (HHS, EPA, DOE, etc.)?

With the likelihood of diminishing resources for research by the federal government, agricultural research must be coordinated with other research agencies in the federal-research sector to avoid wasteful duplication. For example, ecologically based pest management practices and general research related to environmental quality have important ramifications that impact programs of a number of federal agencies.

3. Is the process associated with the food-animal integrated research for 1995 (FAIR '95) adequate for the development of federal agricultural research goals? Are there goal-identification processes which might better serve to enhance federal agricultural research other than FAIR '95?

No Response

4. If the process of FAIR '95 were to be used to adapt an agenda for agricultural research, how would the goals identified in FAIR '95 and listed below, need to be modified to address the concerns of all agricultural stake holders?

No Response

Priority-Setting:

5. Is federally funded agricultural research focused on the issues of highest priority for producers, processors, and consumers; if not, how can the priority-setting mechanism be improved to ensure that these issues are addressed?

Because of the frequently competing forces among producers, processors and consumers, federally funded agricultural research inherently cannot focus in all cases on the highest priorities for each of these clientele groups. Priority-setting mechanisms should include more responsive networking and inputs from these three clientele groups, including specific commodity-oriented units such as Cotton Incorporated, National Soybean and Peanut Associations, etc. Specially funded "pork-barrel" projects frequently are not consistent with established priorities and lack a competitive nature required to ensure high productivity.

6. Should federally funded agricultural research address specific technological and industrial needs? If yes, does the present system fulfill this goal? (If not, please describe how this can best be accomplished)?

Yes, however the present system falls short in fulfilling this goal. For example, numerous pesticides are being removed from the market because of health and environmental concerns; nevertheless, human resources and funding for the plant protection disciplines to develop alternatives are diminishing in many instances. The key needs in this area are for federally funded agricultural research to provide continuity in education and training of scientists, as well as the development of fundamental information essential to resolving plant health problems.

7. Does federally funded agricultural research adequately address projects that result in quantum leaps and benefits, or does it dwell too much on incremental benefits?

Federal agricultural research generally dwells too much on incremental benefits versus the quantum-leap benefits. However, before quantum leaps are possible, incremental steps in our knowledge base must occur. In general, science does not make quantum leaps, it moves slowly through incremental steps that lead to great improvements. The Federal government must provide a climate of stability for agricultural research and extension programs and ensure continuity of funding sources.

8. What is the appropriate role for USDA/REE in ensuring competitiveness in the face of decreases in price support programs?

Some scientists believe that USDA/REE must assume an expanded role as price support programs are dismantled. This includes innovative marketing, greater responsiveness, and dissemination of technical and economic information. Growers will need help in the development of innovative ways to cut cost of production, yet be assured of producing a quality product at a competitive price. Other scientists believe that USDA/REE should not be concerned with price support programs but ensure development of technologies needed for producers to remain competitive.

9. How can the appropriate federal-state-industry resource pools be integrated to develop high priority regional programs in research, teaching, and extension?

The present regional research programs provide an excellent mechanism for integrating regional research priorities but lack adequate funding to achieve desired goals. With diminishing resources, numerous regional research programs should have inter-regional collaboration, building on the exceptional strengths of research units regardless of location. Additional regionalization of programs will required greater cooperation among the states and the Federal government. Regionalizing research and extension programs would entail sharp demarcation from current methods that are mostly state focussed. Even ARS scientist who are designated as regional scientists become so focussed on programs within one state that they fail to cooperate across state lines. In regards to teaching, regional research centers possibly could be developed for specific disciplines or subdisciplines. Truly outstanding programs could be developed by increasing the number of students, staff and faculty to build upon specialized strengths at different locations. With the new technologies for extending information and ready communication, extension programs also could become inter-regional or even national in order to exploit strengths from given regional extension units.

10. How important is the federal agricultural research role in supporting other agencies of the USDA? Other federal agencies? Could this be done more efficiently and at a lower cost?

Clearly, federal agricultural research is extremely important in supporting other agencies of the USDA as well as other federal agencies. These activities could be done more efficiently and at lower expense by reducing inter-departmental competition for funds and overlapping areas of responsibility.

11. USDA reorganization created the Cooperative State Research, Extension, and Education Service (CSREES). In your opinion, how should this newly configured agency function to support the US agricultural enterprise, 1995-2002?

This newly configured agency has the opportunity to revitalize the fundamental concept that has been basic to the success of American agriculture. That is, increase the integration of research, extension, and education.

12. What is the proper place for integrated-systems programs? What roles should the extension service (extension functions within CSREES) play in these programs;

Integrated systems programs will become more important as farms shift from family units to corporate units. The role of the extension service will remain as it has been; to take the proven integrated system and convince producers of its value.

Advisory Boards:

13. Have USDA's research and extension advisory and coordinated boards been effective in planning and prioritizing agricultural research and extension? (Please explain)

Overall, these coordinating boards have been effective. Nevertheless, the two boards and general functions, i.e., research and extension, should be more closely coordinated and interfaced with extension truly providing a role of extending information and feedback to research agencies in regards to research priorities and needs.

14. How have research and extension priorities been changed as result of the recommendations of advisory boards (please provide examples) ? Are there presently too many advisory boards?

Although we lack extensive information on the role of advisory boards, extension priorities clearly have changed in recent years and often to the detriment of the extension program. For example, the attempt of the Extension Service to address a wide range of poorly focused and often unrelated national issues has left this federal function with unclear goals and often divorced from agriculture. The extension service needs to get back to doing what it was designed to do best, extending innovative research information to the American farmer to help them perform in the most cost effective and efficient manner possible. For the farmer to remain competitive he will need all the tools possible to help him cut expenses in his operation.

15. What options should Congress consider to improve USDA's process for planning and prioritizing agricultural research (i.e., how should the research agenda be prioritized)?

A mechanism is needed for inputs from a broader range of the agricultural community clientele. Priorities should be based on objective national research priorities and impacted much less by special interest groups. There is a great need for the agency to have some stability. During the past several years ARS has been in constant flux. Administrators come in with broad sweeping changes, many of which accomplish little but rather lead to turmoil and lost productivity.

16. What role should stake holder advisory boards play in setting the agenda ? What grouping should be represented on advisory boards? Can consumers and partners be accommodated on one board or will it require two?

Ideally, one board should be sufficient with the consumers and partners scrutinizing agenda issues and coming up with consolidated recommendations.

17. Is there a special role for advisory boards to play in international agriculture beyond what has occurred in the past?

Broadly-based clientele advisory boards could play a more significant role in international agriculture than has been done in the past. The focus should be on long-term, positive programs rather than short-term, noncontinuing programs as has occurred too often in the past.

Funding Considerations:

18. What is the most appropriate mix of federally funded basic and applied agricultural research?

The ideal mix of these funds should result in programs that are sufficient to resolve immediate or short-term problems, while providing fundamental information that can provide a knowledge base for future agricultural developments. It is generally agreed that federal funds should probably place a greater, but not exclusive, emphasis on basic research. Whereas the states generally place a greater proportion of resources into applied research. It is essential that funding for applied agricultural research continue. Short-term problems are often best served by applied research. For example, the methyl bromide scenario requires immediate input from short-term research. More important than the ratio of basic to applied research is that there be continuity and an avoidance of rapidly shifting priorities.

19. How, if at all, can the effectiveness and efficiency of agricultural research be enhanced at current funding levels? At reduced funding levels?

At current funding levels, overall effectiveness of agricultural research can be enhanced by more rigorous assessments of all research projects and especially eliminating those that are nonproductive or outdated. Even more rigorous criteria of productivity will be needed at reduced levels of funding. Major research programs probably will need to be regionalized with emphasis placed on developing centers of excellence in different agricultural related sciences. Strengths in various disciplines should be reinforced at specific locations rather than in all states. Interstate barriers would have to be broken down. Budgetary procedures that cross state lines would have to be worked out. Productivity of scientists can be enhanced by developing mechanisms whereby less time is wasted preparing grant proposals that are not funded.

20. How can future funding be determined and justified so as to allow multi-year programs to be completed?

The duration of given projects could be based on the track record of productivity and quality of research.

Opportunities should be available for funding grants of 4 to 5 years, rather than the 2 or 3 years as currently exists. In unusual cases, the opportunity should exist to fund programs for even longer periods of time. For example, develop of a promising biological control agent or novel host resistance for plant-parasitic nematode may require 10 or more years. Well established, high quality programs should warrant longer term funding. Mechanisms of funding also must allow newly established and (or) unproven programs to develop. Critical review of long term projects is needed so that they are not continued beyond their useful life.

21. In view of the growing emphasis on greater accountability of federal expenditures, do you have any suggestions as to how agricultural research results can be measured and their impact evaluated? Is there some standard of accountability for the efficient and effective use of federal research funds?

This question has been addressed extensively through the 1993 Agricultural Performance Act and the related symposium held on research assessments in Washington on August 29, 1995. A key recommendation at that symposium was to have agricultural research projects subjected to assessments related to economic, environmental, and social impacts. In this regard, economists and statisticians should be consulted as research projects are developed and be integrated as full partners of projects. However, there has to be funding of high risk, yet potentially high return projects. If we only fund projects that have a sure return, we will put innovative research at high risk for no funding. A truly valid assessment of the value of a research project may not be possible until several years after completion of the project.

22. What is the proper balance between in-house formula funds, competitive grants and special grants?

The programs in place are working and have worked well for the past many years. There probably should remain a balance of formula funding, special grants and competitive grants. However, the problem is that none of these programs are sufficiently funded at present. A great deal of time and effort is being expended by the agricultural scientist in the pursuit of grant funding, with only a fraction of the good proposals being funded. Ideally for highly productive and competitive research, formula funds and special grants should probably have a lower priority. If this occurs then someway must be found to substantially increase competitive grant funds. Special grants are needed to address localized and unique problems that may be beyond the states ability. A critical review of such programs is needed to ensure high levels of productivity.

23. What guidelines should be used in determining appropriations for specified programs in research, education, and extension?

Specified programs should be limited to those areas that are not reasonably well addressed through established funding and program activities, and not permitted to become pork-barrel projects of low productivity. They should be open to public scrutiny and subjected to evaluation procedures similar to those used by other grant programs.

24. Should federal funds be used for programs only, or for facilities as well? If for facilities, how should these be allotted - competitive proposals or other? Is there a place for regionalizing research, increasing competitive grants, etc.?

Federal funds should be used primarily for programs. When used for facilities, they should awarded on a competitive basis and be used for regional and national needs. Clearly, there is a place for increased regionalized research as well as enhanced competitive grants.

25. Is there a need for partnership not only with state and local public-sector organizations and industry; but, also with private foundations?

With diminishing resources and increased competition for funding, partnerships offer important opportunities, and this should include private foundations as well as public-sector organizations. A more streamlined process for dealing with intellectual property rights and patents is needed and would enhance dealings with industry.

26. To what extent do self-assess checkoff fees on commodities provide resources for research and education? Do these/should these programs support long-term research, as opposed to short-term product development and promotion research?

These checkoff funds have provided important resources for research and education across many states. Although some of the funding is short-term, greater emphasis should be placed on long-term commitments for well defined programs. For example, breeding for nematode-resistance or developing biological control agents. Development of mechanisms that permit a regional approach to commodity funding , including funds from several states going to a single location with special expertise, would be beneficial.

Delivering Agricultural Research

27. In order of priority, what should be the most significant actions USDA could take to improve its management and/or delivery agricultural research?

The Extension Service should be revitalized by a re-affirmation of its importance and then it should be more closely aligned to agricultural research and graduate education. It has been bogged down in unproductive administrative functions that are too far removed from extending the benefits of agricultural research. The visibility of agricultural extension has been poor. With increasingly efficient communication technologies, more emphasis should be placed on developing strong regional programs with less emphasis on county level activities. Because our society is predominately urban rather than rural, perhaps extension should become a public relations agent for agriculture and agricultural research.

28. What options should Congress consider to improve the delivery, results, and benefits of federally funded agricultural research?

Continued support for the Extension Service should be reaffirmed. Moral is a current problem due to budget cuts at the state and federal level.

29. What should be the federal role in ensuring training of future work forces for the food and fiber needs as well as the national resource concerns of the public?

The continued support of the Land Grant System should serve as the foundation for this function. This should include the provision of adequate funds for education of future work forces as well as enlightening the general public.

Land Grant Universities:

30. What is the continuing role of Land Grant universities? 1890 colleges? 1994 colleges?

Land Grant Universities still must serve as the nucleus of our research, education, and extension programs in agriculture as well as in other disciplines. Still, innovative programming is needed to interface and enhance the collaboration between the land grant universities and the 1890 and '94 colleges.

31. Is the current formula used for allocating federal funds to land grant universities fair, reasonable, and does it stress changing conditions? If not, how could it be improved?

The current formula clearly has been successful as reflected by the success in American agriculture. Nevertheless, adjustments may need to be made to reflect the increasing regional nature of agricultural research. One of the major problems with formula funding is that it is not responsive to changing priorities and conditions. The formula funding needs to be tied to the importance of agricultural within a given state and not be tied to numbers of farms or farmers that exits within a state.

32. The land grant universities have a system of agricultural experiment stations in each state. In today's environment of federal and state fiscal constraints, is such an extensive system of research stations still warranted (please explain)? Could certain functions be merged with other USDA agencies, other federal agencies, etc.?

As suggested earlier in other answers to questions above, all states may not need extensive agricultural experiment stations. However, most do and, since American agriculture has been well served by the system , it should not be dismantled. There is no question but that we have the premier agricultural system in the world. We should make every sacrifice to ensure its continued success. However, some adjustments could be made without seriously jeopardizing this premier system. This is especially true as it relates to given disciplines that could be regionalized rather than localized in each state. Each individual state system does not need, nor can it afford, expertise in all areas of agriculture.

33. How can agriculture research be best coordinated among federal-state, and private institutions?

Possible mechanisms to address this issue include regional research programs that might encompass private institutions as well as federal and state and through the use of increased collaborative, but competitive funding. A reduction in "red-tape" with regard to intellectual property and patent rights will increase cooperative efforts with private institutions.

34. What models currently exist, and are used to provide regional cooperation in regional research and extension?

The best model that is currently exists is the regional cooperative research programs. However, this program may be decreased because of short sightedness of experiment station directors who use regional funds for general support of their system rather than direct support to approved regional projects. With the increased use of new modes of communication, regional as well as national, extension and research programs have much promise. Regions should not be rigidly defined as Florida, Louisiana, Texas and Hawaii might define a region with regard to many tropical agricultural problems. Funding vehicles that give priority to multiple- state and multiple discipline efforts encourage regional projects. However, in many instances such multiple-state or multiple discipline projects are funded at levels similar to projects with a single investigator and are, thus, under funded.

35. In the current area of constrained resources, is it appropriate to use federal funds to promote cooperative regional research to reduce unnecessary duplication, and to what extent is it appropriate to use federal funds to encourage consortia of states to establish individual centers of excellence to address common problems?

Clearly, it is most appropriate to invest federal funds in effective and efficient, nonduplicated research. Regionalizing many aspects of agricultural research and extension is a worthy goal. However, we have few working models, thus we would be treading on unchartered waters. It should be similarly effective to establish centers of excellence to address common, regional, or even national problems. Care does need to be exercised in eliminating unnecessary duplication of efforts because without duplication there is no competition. A lack of competition will reduce research quality.

36. As societal concerns about natural resource use, rural development, animal well-being, etc., are integrated into the USDA agenda, is there a role for new partnerships with the federal sector?

Yes!

37. Other parts of the federal government sponsor research directly applicable to the food and agricultural system. The National Science and Technology Council is intended to address the coordination of related activities across agencies. How is this intended to work in the case of research and extension on food and agriculture? How well is it actually working? Or are alternative methods needed?

This mammoth function is working only reasonably well at best. A more consistent effort in the coordination is needed, possibly through NSTC.

Toward National Research Initiative

38. Congress authorized the National Research Initiative (NRI) Competitive Grants Program at $500 million per year; if NRI is to be fully funded, where in the USDA research budget could money be transferred from?

Monies could be transferred from the special projects, outdated USDA and state research programs. However, if special projects are terminated, e.g., PIAP, SARE, IPM, CBAG, etc., the NRI must encompass applied as well as basic research. When one thinks about it we really have not gained anything by transferring funds from special projects that have defined missions. The greatest need is for new money. Green plants are the principal primary producers on Earth and provide the basis for much of our civilization. If food and environmental preservation are essential to human health and well being, shouldn't agricultural research programs be as well funded as medical and military research programs?

39. What other options for funding the NRI should Congress consider?

The greatest resource that could be considered would be through the savings resulting from dropping commodity price supports and (or) other federal entitlements.

40. Have NRI appropriations been used to expand agricultural research or have they been used to continue existing programs?

Both. The highly competitive nature of the NRI programs helps ensure that only the most productive, high priority programs are funded. Yet many excellent programs remain under funded.

Agricultural Research Service (ARS) Laboratories

41. Should the USDA have research laboratories or should it provide competitive funding to existing entities such as Universities?

The USDA should have some research laboratories to address needs that simply can not be met by experiment stations and private industries. However, it should provide greater competitive funding to existing universities and other research agencies.

42. Should more ARS laboratories be co-located at Land Grant Universities? What should be the relationship between ARS and land grant universities scientists? Between ARS research coordination? How can ARS laboratory functions be more effectively linked to State Agricultural Experiment Stations?

Many university scientist believe that to maximize productivity and educational capabilities, ARS scientists should be located within land grant universities. Yet, many ARS scientists feel that research productivity is enhanced by being at separate locations. Too often funding sources are limited to only university or to only ARS scientists. Such barriers impede cooperation.

43. Are ARS facilities effectively used in performing needed research? If not, please explain and offer suggestions for better use?

Most ARS laboratory facilities clearly perform needed research. They are staffed with highly qualified scientists. Nevertheless, these facilities and scientists would be more effective if integrated within the experiment station-university campuses. Many experiment stations and ARS laboratories are suffering from lack of critical mass of scientists, staff and students. The true integration of ARS scientists and staff would help offset the downsizing that is currently occurring. Physical isolation often leads to intellectual isolation.

Extension Service (Extension functions within CSREES)

44. The USDA Extension Service (ES) mission is, among other things, to disseminate research results to farmers and other consumers. In your opinion, is the ES effective is carrying out this mission? (Please explain.)

Traditionally, the Extension Service has been very successful in meeting these goals. Today, however, the Extension Service seems to be overwhelmed through excessive programming on issues that are not necessarily related to agriculture and other consumers. For the Extension Service to continue, its realignment with agricultural research and feedback to agricultural research is critical. In many instances, extension personnel are being asked to make up for budget cut backs with research grant funds, which then requires that they split their time between research and extension. Thus, less of the needed extension is being accomplished.

45. Should ES be involved in addressing the problems and challenges confronting urban populations?

Yes, but not at the expense of its primary intent of servicing farmers and general consumers. The political will to fund all of agricultural research depends on the future ability of extension to address the concerns of urban America. The Extension Service needs to play a larger role in educating the urban and suburban public on the value of agricultural research.

46. What, if any role, should ES play in dealing with the social issues facing farmers and rural communities?

These issues should be secondary to the primary objective of aiding farmers with agricultural related problems.

47. Should the ES's mission statement be changed to focus on production agriculture?

Es's mission can be profitably expanded, but so must its resources. The mission must be linked to the level of funding. Es can not be continually asked to do more with less!

48. What should ES not be involved in?

Issues not related to extension of agricultural research to producers, or education the public on the value of agricultural research and the overall importance of agricultural to our national interests.

Dissemination of Agricultural Research

49. Do you have any suggestions on how USDA's dissemination of federal agricultural research results can be improved?

With the new technologies now available for communication, research results can be delivered to growers and consumers, and popularized versions can be developed for the general public. ES is our communication expert, provide them with the means to increase their effectiveness.

50. Who is, or will be, responsible for developing a marketing plan for agriculture and its science in education programs to the American people?

Unfortunately, this function has been neglected too often, and this failure has resulted in the American people failing to appreciate the success of agricultural research and the miracle of the American grocery store. The USDA should be responsible for these important functions. In addition, land grant universities should have programs that complement the federal programs.

Current Research Information Systems (CRIS)

51. ARS uses CRIS to provide information about USDA research projects, how, if at all, do you use CRIS?

We use CRIS primarily for mandatory reporting of research results. In addition, these reports and modifications, thereof, are used for local, annual reports. Few researchers use CRIS reports to determine the status of current research. Most researchers use other data bases, most of which charge some fee for access, for keeping current with research progress.

52. In your opinion, is CRIS effective in helping you obtain information on federal agricultural research projects? If not, what changes are needed to this information system that would provide quality data on federal and state agricultural research? (Please explain.)

The CRIS has limited effectiveness in obtaining information on agricultural research projects. Nevertheless, this program should be revised and updated to enhance its usefulness. The quality of the reports is not good.

53. Is there/shouldn't there be an appropriate and adequate management information system(s) and place to report and collate results from federal investments and research, extension, and higher education sponsored by the USDA (and related research agencies)?

Yes, this system should include popularized versions of major research findings and these could be distributed through national media as means of informing our clientele of the progress made through research. Obviously we have not done a good job telling the American people the value of agricultural research.

54. Does the CRIS system and other USDA reporting systems provide an adequate accounting of the research and extension work that is being done in America?

No! As a minimum, popularized versions of each CRIS report should be provided by given project leaders, and these could be collated and developed for this purpose. The major story is never told via CRIS. It is an outdated system.

International relations

55. How can the USDA be most effective in the short- and long-term through its support of international activities?

For these international programs to be effective, continuity is a must. In some way, information exchange and institutional strengthening must be central components of any international activity. Unfortunately, most ongoing international programs have very short-lived effects because of the lack of a mechanism for continuity and strengthening of related institutions in developing countries. Some researchers question whether USDA should be involved in international activities. The USDA might be most effective in evaluating trends and marketing information.

56. Currently, USAID and other programs extend agriculture and agricultural development beyond the nation's borders. What continued or expanded role should USDA play in international research, education, and extension?

USAID apparently has greatly reduced its activities in agriculture. As a result, there is an increased need for agricultural programs in research, education, and extension that should be addressed through the USDA. Again, these should be designed for long-term, ongoing effects rather than short-term programs.

57. What is the role of USAID in funding agriculture research and extension? Has USAID maintained support for agriculture or has the agency moved away from agriculture-related programs? What is role of long-term agriculture R&D in developing countries in developing new markets for U.S. products? Should USAID contract through USDA/REE for long-term agriculture R&D?

As indicated in question 56, USAID has moved away to a large degree from agricultural programs. Apparently USAID has given its priorities to social causes, which is to the detriment to agricultural. As global production and marketing develop, USAID should renew and revitalize its R&D programs, including contracts through the USDA/REE. This is especially important for long-term continuity in agricultural R&D. USAID funds for agricultural research programs and technology transfer have provided substantial support for many research programs important to US agriculture.

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Date 12-1-95	# of pages ▸ 1
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December 1, 1995

Dr. John J. Goldberg, Science Fellow
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Committee on Agriculture
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Dear John

Enclosed is the response from the Poultry Science Association. Hope its not too late. We have also been involved in the responses from CoFARM and from AAAS.

Best wishes,

Mary Ann

Mary Ann Ottinger
President

MAO/pmb

Enclosures

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Poultry Science Association PA 1

Agricultural Research, Education & Extension Questions for Discussion

Federal agriculture research goals

1. What should be the role of the Federal Government in agricultural research?

Agricultural products are the foundation of life. Mankind can subsist without all other technologies, but the culture of food, fiber and forestry products are essential for the existence of mankind. Agricultural products are mature commodities. Thus, the only means of maintaining the desire to produce are through profitability which is gained through increased efficiency and novel use. While private sector producers conduct agricultural research, it is solely for competitive purposes. It fuels consolidation of producing units, and it adds nothing to the general knowledge base. Private allied industrial research effectively provide research, knowledge, and products, however knowledge gain is short sighted, profit motivated, and less likely to benefit the family farm and shift trends in agriculture.

To assure that the subsistence of the U.S. population is never totally dependent on a few consolidated industries or beyond our borders, the roles of the Federal Government in agricultural research are:

1) To financially support basic research that increases the fundamental knowledge of economically important agricultural related strains and species.

2) To financially support research on practical agricultural problems and methods which are not sustainable or risk human health and the environment.

3) Provide financial support for the commercialization of evolving technology.

4) Provide financial support for transfer of technology.

2. To what extent should goal setting and goals in agricultural research be cognizant of and coordinated with research activities in the rest of the Federal research sector (HHS, EPA, DOE, etc.)?

We believe that the research initiatives involving biological and agricultural sciences have a number of common goals. In so much, it would be appropriate for a portion of the budget from each of the Federal Research sectors to be pooled to address national interest and problems. These pooled dollars should be used to address areas of research which are multi-disciplinary in nature and thus should be used to fund team approaches to solve problems.

3. Is the process associated with Food Integrated Research for 1995 (FAIR 95) adequate for the development of Federal agriculture research goals? Are there goals identification processes which might better serve to enhance Federal agricultural research other than FAIR 95?

FAIR 95 serves as an important vehicle to identify common research initiatives important to agriculture. It is essential that all sectors of agriculture be represented at FAIR 95 to assure balanced input.

FAIR 95, however, should not be construed as the only mechanism for research goal setting. It simply represents a consensus of research objectives. We feel that many of the most innovative and life changing discoveries originate in individual and team research objectives. Freedom to pursue such objectives must always be acknowledged and supported, even when consensus is lacking.

4. If the process of FAIR 95 were to be used to adopt an agenda for Federal agricultural research, how would the goals identified in FAIR 95 and listed below, need to be modified to address concerns of all research stakeholders?

1) Enhance industry wide responsiveness to consumer and societal concerns.

Each stakeholder or representative of society and industry should have a voice in determining FAIR 95's research initiatives.

2) Meet market demands through increased efficiency and competitiveness.

Increased efficiency and competitiveness in the global market place require a mechanism of competitive advantage only through such an advantage is a research initiative of value for investment and development. The research initiatives of FAIR 95 must encourage and support the process of establishing and protecting intellectual property rights for individual scientists and scientific teams. Appreciation for patent protection will insure that discoveries made have value worthy of investment and thus competitive advantage.

3) Develop integrated food animal management systems.

FAIR 95 represents a unified voice in deciding select research initiatives across agricultural disciplines. Thus, by the nature of unison discussions, it facilitates the development of integrated food animal management systems. It is essential that each food animal system be equally represented by FAIR 95.

4) Maintain and enhance environmental quality.

Simply assure the issue of environmental quality is a topic of discussion.

5) Improve food quality control in terms of safety, desirability, and nutritional composition.

No change is necessary. This topic will already be valued by participants in FAIR 95.

6) Enhance animal well-being throughout the life cycle of food-producing animals.

No change.

Priority Setting

5. Is Federally funded agricultural research focused on the issues of highest priority for producers, processors, and consumers? If not, how can the priority setting mechanism be improved to insure that these issues are addressed?

Federally funded competitive research projects are typically basic in nature with relevance to priority areas to producers, processors, and consumers. The competitiveness of the funding typically results in research which has little or no immediate commercial value, but long term benefits in science. Successful awards generally provide adequate funding to conduct a single laboratory project of adequate depth.

Federal funding for HATCH and Regional projects often provide limited funds which are used to solve agricultural related problems and thus can be applied more immediately. The nature of these projects, however, very from institute to institute. Level of funding to investigators is low and thus impact is minimal.

Federal funding through Agricultural Research Services tends to be specifically targeted to producers, processors, and consumers. Benefits derived in the short term are more likely since level of funding provided allows for intensity and commitment for problem solving.

Several problems exist with regards to Federal funding of agricultural research:

•Competition in the competitive grants formula is so keen due to the limited funds available that many good proposals go unfunded.

•The funding ceiling per grant in the competitive grants program is too low to encourage multi-disciplinary research proposals.

•Funding distribution of awards made by the competitive grants program is skewed toward the number of research FTE in a given species rather than economical value of a given species.

•The competitive grants program funds research in declared priority's areas. Novel approaches in agricultural research which could have a major impact on agriculture have no funding mechanism if outside the priority. Novel ideas often proceed priority.

•Funding for applied research tends to be excluded from the competitive research program, and level of funding in HATCH and Regional project are insufficient to support serious investigation into problem solving.

•Funding at ARS by-passes the traditional peer review process.

6. Should Federally funded agricultural research address specific technological and industrial needs? In yes, does the present system fulfill this goal?

Yes, but in a selective manner. Basic research to increase our scientific understanding of industrial needs should be conducted using Federal research dollars. Applied projects involving technology transfer and innovative approaches to industrial needs should also be funded. The Federal government must be involved in funding the development of biological reagents used to advance agriculture. The Federal government, however, should not be involved in funding research that can be done or funded by industry.

The current method of peer review in the competitive grants program appears effective in assuring the development of basic knowledge to meet and identify new technologies and needs. Mechanisms for transfer of technologies that are public knowledge (not patent protected) are greatly limited.

7. Does Federal agricultural research adequately address projects that result in quantum leaps in benefits, or does it dwell too much on incremental benefits?

The competitive grants program results in the most rapid progress. The nature of current priority setting, proposal submission, peer review in the competitive grants program is designed by nature for incremental benefits. Quantum leaps occur in development areas that tend to be unknown to most scientist and clearly not viewed as a current priority. Research in areas that result in quantum leaps are also rarely accepted by the peer review process and thus remain poorly funded. The establishment of priority areas limits the freedom and resources to explore the unimaginable. The competitive nature of funding results in constrained research design and requires preliminary data that demonstrates the plan will succeed. Some level of funding should support academic freedom and encourage unrestrained creativity.

8. What is appropriate role for USDA/REE in insuring competitiveness in the face of decreases in price support programs?

Reductions in price supports will result in the consolidation of commodity producers. This consolidation will encourage the implementation of technologies already developed to improve efficiencies. The consolidation in turn will fuel decreased cost, following initial rises, associated with eliminated price support. Since consolidation will disrupt the traditional agriculture structure, it is essential that alternatives in agriculture production be developed. Non-commodity uses of agricultural products must be a focus of USDA. Technologies are being developed to assure alternatives to rural America. These technologies included specific crops and animal products in non-traditional uses. Since the uses of these products require limited production, they are well suited for the family farm unit and thus have limited attraction to consolidation units. USDA must aggressively participate in education and transfer of these new technologies to rural America. USDA must aggressively encourage and support research to expand the development of these technologies and basic research for the next generation of technologies.

9. How can the appropriate Federal-State-Industry resource pools be integrated to develop high priority regional programs in research, teaching, and extension?

National, Regional, and State consortium representing specific sectors of agriculture have been established (i.e., American Egg Board, National Pork Producers). To a limited degree, these consortiums provide research funding. Unfortunately, these monies are rarely leveraged. Matching dollars where appropriate would be an effective means of leveraging research dollars for applied industry based research. It is important to note, however, that such research projects would not result in marked increases in knowledge, but would be useful in problem solving.

An additional source of funds are the SBR funds. Currently these dollars are already effectively used for developing or transferring new technologies to the marketplace. These funds could also be leveraged against state initiated technology development fund programs.

It is important that the federal government removes any statements with regards to intellectual property rights when allocating said dollars.

10. How important is the Federal agricultural research role in supporting other agencies of USDA? Of other Federal agencies? Could this be done more efficiently and at lower cost?

Research, implementation, and technology transfer activities that have a broad interest in sectors of agriculture should be supported by the Federal agricultural research program. Such activities that are critical to U.S. agriculture, but are unlikely to have private sector support, must be funded by the Federal agricultural research program (i.e. Prevention of disease entry). This support should not be limited within USDA, but should include other federal agencies when appropriate. Duplication should be eliminated. All programs supported should be reviewed by objective and knowledgeable reviewers who are not stakeholders. Programs should be discontinued when they serve limited purpose.

11. USDA reorganization created the Cooperative State Research, Extension, and Education Service (CSREES). In your opinion, how should this newly configured agency function to support the U.S. agricultural enterprise, 1995-2002?

As agricultural sectors consolidate, the generalist must focus on alternative forms of agriculture for displaced farming units. Increased specialization covering areas even beyond traditional agricultural disciplines must be developed. A new breed of specialists at state universities must develop talents that can be used beyond state lines and work in teams to disseminate complex and integrated systems.

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12. What is the proper place for integrated systems programs? What role should the Extension Service play in these programs?

These programs must be initiated, researched, developed at the Land Grant Institutions. These integrated methods used to research and solve problems today, require an integrated team of extensionists to disseminate the technology to the end user. Extension must be equipt with broad range of in-depth technical talent, instead of the generalist approach. Teams with individuals specialized in each area of the integrated programs should work together in disseminating system methods.

Advisory boards

13. Have USDA's research and extension advisory and coordinating boards been effective in planning and prioritizing agricultural research and extension?

Its success is evident by our ability to be a major food producing country. However, new strategies will be needed for future activities (see 17).

14. How have research or extension priorities been changed as a result of recommendations of advisory boards (please provide examples)? Are there presently too many advisory boards?

15. What options should congress consider to improve USDA's process for planning and prioritizing agricultural research? (i.e. how should the research agenda be prioritized?)

FAIR 95 is an example of establishing priorities. Flexibility beyond set priorities should remain valuable.

16. What role should stakeholders have input into setting the agenda? What groupings should be represented on advisory boards? Can "customers" and "partners" be accommodated on one board or will it require two?

Stakeholders should have input into setting the agenda, however their input should serve at the beginning of the priority establishment phase. The advisory board should be made up of leading scientific developers of technologies (both applied and basic). Scientific representation should be balanced with regards to agricultural customers. Scientific advisors should also be knowledgeable about the agriculture industry which they represent. While it may be useful for industry and advisors to meet together in the initial stages, final priority setting should occur without industry participation.

17. Is there a special role for advisory boards to play in international agriculture beyond what has occurred in the past?

The future growth and maintenance of agriculture product development are dependent on international trade. The advisory boards must have a complete understanding of international acceptance of technologies that will be developed in the future, and thus research priorities that should be set. Prioritization of research objectives should occur with a sense of understanding of acceptance. However, such priorities should not exclude research that enhances knowledge of animals, plants, and pests.

Funding Considerations

18. What is the most appropriate mix of Federally funded basic and applied agricultural research?

Defining basic and applied research is problematic. Hopefully, all research will eventually be applied, but the time frame for implementation or use may be in the distant future. For the sake of this discussion, applied research will be defined as that research which will be used within five years, whereas basic research may be implemented or used after five years. Many times, agricultural companies are more interested in funding research that has more immediate application to their needs. Furthermore, states may be in better position to earmark funds for applied research that directly effects a particular locality. Given the tremendous importance of basic research for the development of new technologies necessary to keep agriculture positioned for the every increasing population, and to continue to develop strategies to protect the environment, the government needs to have a major role in funding basic research. Therefore, an appropriate mix of basic/applied research may be 60/40 or 70/30.

19. How, if at all, can the effectiveness and efficiency of agricultural research be enhanced at current funding levels? At reduced funding levels.

To some degree, stakeholders should have input into developing lists of research needs. However, it must be kept in mind that directing all research into so called "priority areas" is dangerous and shortsighted. No one is able to predict future needs, nor know how one avenue of research may revolutionize science in the future. Certainly, no one could have predicted that studying restriction enzymes in bacteria would have provided the foundation for the explosion in biotechnology.

Efficiency and effectiveness may be opposing concepts. The pursuit of new ideas can not be regarded as an efficient process. Most new advances and breakthroughs occur as a result of accidents. Such "accidents" occur because people are working on many different ideas, and some avenues of endeavor prove successful while other do not. In an effort to improve so called efficiency, there is a danger of destroying effectiveness. With an increase in accountability, many times effectiveness is judged by numbers of publications. This encourages a "production-like" attitude in which the goal is to crank out large numbers of papers. People are discouraged from high risk research, or from pursuing lines of inquiry which do not insure a publication. In order to make breakthroughs, it is desirable to take risks.

It is equally dangerous to view education as an efficient process. In fact, quality education is inefficient. One can not sit down with their son or daughter and begin by saying that they only have 5 hours to learn the multiplication table. While some children may learn the table that fast, what about those that don't grasp the subject that fast. Do we abandon them and walk away because it has not been "efficient use of our time"

To increase the effectiveness of agricultural research, greater investments should be made in preserving the model of research and education that has been used at the land grant colleges throughout the century. At these institutions, it used to be possible for scientists to maintain both a successful research and teaching program. Both teaching and research efforts supported one another and helped scientists stay current. In addition, students benefited by learning the most recent advances from people who were on the front lines developing new technology. Presently, it is becoming nearly impossible for a university faculty member to maintain both a quality teaching and research program. The current funding situation clearly favors the large lab containing many post-docs, and which is dedicated solely to gathering data, publishing as many papers as possible, and constantly writing grants. The model described above of the scientist who wears several hats is a major disadvantage under the current funding atmosphere. However, scientists involved in teaching, extension, and outreach tend to have a broader view and a better understanding of the problems. In addition, their ability to move from basic to applied, and often across discipline, would suggest they are best able to develop innovation and quantum leaps of knowledge. It thus is essential that agriculture maintains its own educating, research, and outreach.

20. How can future funding be determined and justified so as to permit multi-year programs to be completed?

Project-based funding addresses this problem. When competitive grants are awarded, they are awarded for a period of time which should correspond with the time necessary to complete the objectives of the project.

21. In view of the growing emphasis on greater accountability of Federal expenditures, do you have any suggestions as to how agricultural research results can be measured and their impact evaluated? Is there some standard of accountability for the efficient and effective use of Federal research funds?

With the increase desire for accountability, everyone is looking for the Holy Grail to measure this trait. Attempts to directly show how all research increases productivity of a given agricultural sector, or to show a cost-benefit ratio of every research result will prove fruitless, and highly inefficient. The best measures of accountability continue to be publications, patents, teaching evaluations, invited lectures, etc. In addition, we already use several other forms for evaluating accountability including AD-416, AD-417, AD-421, and AD-419. As organizations continue to increase the time and money spent on accountability, our effectiveness decreases. As resources have decreased, the level of accountability has increased to the point of hiring more people simply to manage the paperwork. This is counter-productive.

22. What is proper balance between in-house, formula funds, competitive grants, and special grants?

Formula funds and competitive grants are necessary if the proven success of Land-Grant Institutions is to continue. Monies provided for both formula funds and competitive grants are insufficient. When the NRI was initiated, it was supposed to receive $500 million this year. However, it is actually being funded at approximately 20% of that level, and cuts are being proposed by the House of Representatives. Monies provided to universities get used in many ways including research, teaching and extension. All three of these missions work synergistically to benefit not only agriculture, but the community at large. The combination of research, teaching and extension has provided an effective avenue of not only developing new technology, but in disseminating the information. Currently, formula funds have been dwindling to the point that they are generally a very small percentage of the current funding at most universities. It is suggested that there be a 2 fold increase in formula funding and a 1 fold increase in competitive grants.

It is essential that those involved in decision making understand that the vast majority of hard university dollars in agriculture are salaries (95% is not uncommon). Thus, little is available for operating supports.

23. What guidelines should be used in determining appropriations for "specific programs" in research, education, and extension?

When specific areas of need can be identified that are important for agriculture, monies should be made available in the form of competitive grants. Competitive grants encourage high quality proposals that are subject to peer review. Ear-marking funds for political purposes generally defeats the goal of funding the highest quality projects, and it also removes resources from other funding needs. The competitive grants under NRI in "target" areas seems to work well.

24. Should Federal funds be used for programs only, or for facilities as well? If for facilities, how should they be allotted - competitive proposals or others? Is there a place for regionalizing research, increasing competitive grants, etc.?

There is definite need for funding of facilities in addition to programs. States and universities lack the resources to provide the facilities necessary to ensure quality research and teaching programs commensurate with those needed to ensure that U.S. agriculture remains competitive. A strong agriculture is essential for every level in order to support the meager resources present at the state level. Competitive funding still appears the fairest and most equitable way to provide such funds. Regionalizing research is possible only if logic prevails and should arise from interactions at the scientist level, not from the top down.

25. Is there a place for partnerships not only with state and local public sector organizations and industry; but also with private foundations?

Such partnerships already exist, and probably need to continue in the future. Private foundations are an important source of research funds.

26. To what extent do self-assessed "check-off" fees on commodities provide resources for research and education? Do these/should these programs support long-term research, as opposed to short-term product development and promotion research?

Check-off funds can be an extremely effective avenue for funding both research and education programs. The benefit of such funds is that they tend to be ear-marked for a particular commodity and thereby ensure that research and educational programs are supporting their needs. Such funds, however, tend to be more for short-term needs rather than basic, long-term goals. As stated under question 18, this is why USDA needs to have a strong effort devoted to basic research.

The other problem with check-off funds is that, in some cases, the universities tend to under fund programs that have strong check-off fund support. In doing so, the universities endanger losing the check-off programs since these later programs are not developed to be a substitute for state or federal funds.

Delivering agricultural research

27. In order of priority, what would be the most significant actions USDA could take to improve its management and/or delivery of agricultural research?

Regarding management, consider moving ARS stations into closer unity with land grant universities. ARS scientists should become members of the meet the rigor of tenure and review process of academic personnel. The state system partners research, teaching, and extension. While ARS is very effective at research, it does not integrate research with teaching and extension. While attempts have been made for ARS to disseminate information to commodity groups, this task is best handled by the extension personnel present in various states. Such personnel have the contacts and avenues to deliver information to various user groups. For ARS to handle this function would be a duplication of function, and an inefficient use of resources. Thus by integrating its scientists within the land grant university, duplication will be eliminated and realized. Such integration has already successfully been accomplished at select institutions.

28. What options should Congress consider to improve the delivery, results, and benefits of Federally funded agricultural research?

USDA does not need to re-invent the wheel. The most effective means of disseminating information is the Extension service, and peer-reviewed journals. To deliver information to various commodity groups, the extension service is well situated to handle such needs. To deliver information to fellow scientists, the journals are the best delivery system. One only needs to visit a country which lacks an effective extension service in order to realize how necessary this organization is to U.S. agriculture. In such countries lacking an extension service, information is developed at the universities, and then never put into practice.

29. What should be the Federal role insuring training of future forces for the food and fiber needs as well as the natural resource concerns of the public?

Question 27, 28, and 29 are closely related. As described in previous questions, universities provide an effective means of combining research, teaching, and extension. Not only are faculty members involved in both applied and basic research, but they provide such information to students and user groups. Furthermore, the system is able to go full circle in that extension personnel bring information back to the university so that researchers know what is needed, and how best to direct their programs. In other words, there is a two-way exchange of information. In addition, universities function to train the future work force.

Land Grant Universities

30. What is the continuing role of Land Grant Universities? 1890's colleges? 1994's colleges?

Land Grant Universities will continue to play vital role in generating new knowledge and technologies, educating future scientist and agricultural personnel, and transferring such technology (extension). However, the way these activities are conducted will change.

Consolidation of commodity production will require a higher level of education in employees of these consolidated industries. However fewer employees will be needed per unit of commodity production. Smaller producers will move away from commodity production to produce new technologies being developed. The switch from non-traditional farming to new technologies will require a higher level of education at the family farm. Thus the demand for college educated should remain stable in the coming decade.

The decline in monetary support for higher education will force regionalized instruction in specific sectors of agriculture. Customer consortium will form and invest in these regionalized training programs to assure the continued training of their future educators, scientists, and employees. Regional centers will use a broader range of faculty expertise in training students. This expertise will cross traditional departmental borders to generate a more comprehensive training of complex integrated systems.

Research will also involve increased collaborations across departmental lines and discipline. These collaborations will result in the development of centers for solving problems and to advanced knowledge.

Reduced federal funding will result in increased patent protection of intellectual property, and increased industry-funded research.

Extension specialist will technically focus and increase mobility across state lines. Multi-disciplinary technical teams will form to transfer knowledge involving integrated approaches.

Critical to the continued success in U.S. agriculture, is the agriculture's continued role in conducting basic science, developing its own expertise, and educating those interested in its sciences. The thought that other fields of science could meet the needs of agriculture is inane. Agriculture's role in research should be recognized as fundamental.

31. Is the current formula used for allocating Federal funds to Land Grant Universities fair, reasonable, and does it address changing conditions? If not, how could it be improved?

While formula funds continue to be of importance to Land Grant universities these funds have decayed in real dollars to a point where they can no longer sustain the true cost of conducting a single research objective. Restoration of formula funds to previous levels would provide flexible monies to conduct research which is multi-disciplinary, and of significant scope. To the individual scientist cost of allocation of formula funds can exceed the amount of the allocation.

32. The Land Grant Universities have a system of agricultural experiment stations in each state. In today's environment of federal and state fiscal constraints, is such an extensive system of research stations still warranted? Could certain functions be merged with other agencies, other Federal agencies, etc.?

The Agricultural Experimental Station found in each Land Grant university is essential. However, the multiplicity of research stations within each experiment station need review to determine if these resources could be more effectively used with each experiment station.

33. How can agriculture research be best coordinated among Federal, State, and private institutions?

Through interactions of representative of commodity producer groups, scientific association, and Agriculture Research Services.

34. What models currently exist, and are in use to provide regional cooperation in research and extension?

University extension specialists interact on a National Basis through yearly scientific association meeting. National agendas are often defined at such meetings. Regional research projects are currently occurring. However, the level of funding is not directly related to acceptance of a project (variations occur from University to University). Thus the regional research program has limited attraction for scientific participation.

35. In the current era of constrained resources, is it appropriate to use Federal funds to promote cooperative regional research to reduce unnecessary duplication; and to what extent is it appropriate to use Federal funds to encourage consortia of states to establish individual centers of excellence to address common problems?

The Federal government should not fund centers of excellence unless such a center is regionally unique and accepted. If a center fills a regional void or prevents a regional void, then Federal support is acceptable.

With regards to cooperative regional research the Federal government should encourage such activities. Unfortunately, the current system of funding such cooperative projects is not directly linked to the proposed research. In addition, when funds are provided, the amount is often not significant enough to carry out specific aims.

36. As societal concerns about natural resource use, rural development, animal well-being, etc. are integrated into the USDA agenda, is there a role for "new" partnerships with the Federal sector?

The suggestion is that society is generally concerned about natural resource use, rural development, and animal well-being. These are issues driven by a highly vocal, small segment of our population. We question why such vocal groups should be given an ability to prioritize the research agenda. Society is more interested in food availability, food safety, preservation of the U.S. food supply, human nutrition and health, and food budget bill. Scientists provide a balanced view on both extremes. No new partnerships are needed. In fact, certain new partnerships would generate decisiveness in Federal Research, ineffectiveness, and an erosion of its mission.

37. Other parts of the Federal Government sponsor research directly applicable to food and agriculture system. The National Science and Technology Council is intended to address the coordination of related activities across agencies. How is this intended to work in the case of research and extension on food and agriculture? How well is it actually working? Are alternative methods needed?

While agriculture scientists do receive funding for research that uses model species of agriculture interest, the intent of said research is not for agricultural, but for increasing knowledge or improving human health. In general, agricultural scientists are not limited to a specific source of Federal funding. Since each Federal research agency has a different mission, coordination of activities by the National Science and Technology Council represents an added layer of bureaucracy and will accomplish little when cooperation is apparent, existing agencies should meet together and plan such activities.

National Research Initiative

38. Congress authorized the National Research Initiative (NRI) Competitive Grants Program at $500 million per year. If the NRI is to be fully funded, where in the USDA research budget could money be transferred from?

Dollars earmarked for specific research purposes or locations should receive independent review to determine if such allocations are of high scientific merit. The allocations of any USDA research dollars in the absence of objective peer review, should be considered a potential source of moneys for allocation to NRI. It is improper to assume that research priorities set can be best conducted at a given location by a group of scientists is the absence of peer review. A more appropriate use of all Federal research dollars is to set an equal minimal discretionary funding level for creative thought (i.e. $25,000 per year per research full time employee) with the remaining awarded on a competitive basis. The method of establishing peer review must be equitable as to not bias the intellectual freedom of those competing for such competitive dollars.

39. What other options for funding NRI should Congress consider?

The cutback in subsidies to farmers will become hardships. These hardships, especially small family farms, can be overcome with alternatives to traditional commodity production. A formula should be placed in the planned subsidy roll back to allocate a portion of the federal subsidy outlay to the development of research projects which can provide alternative forms of agriculture. Technologies are being developed at universities and Federal research laboratories which suit such viable alternatives. Considerations should also be given for a minimal non-competitive funding level to stimulate free thought, creativity, scale up, and transfer of such technologies.

Congress should question its role in federally funding the entire research budget on commodities. While it is appropriate for the US to support basic research related to commodity type products, commodity organizations should play an active role in sharing the financial burden of conducting research on common problem issues which have known impact to their profitability. This is particularly true as commodity production consolidates into fewer and fewer hands. Organizations currently exist for shared funding potential.

Congress must also consider intellectual property rights. The creation and publication of knowledge has only a limited monetary value. Published knowledge can spark the development of new ideas. However, knowledge available to pubic domain cannot create jobs and businesses directly. Intellectual property that is first patented prior to publication will, in contrast, fuel development and create new technologies and businesses. No investor can afford dollars for development if protection for a limited period is not evident. The only mechanism to stimulate investigators to seek patents on their research development is to increase education in the process, to provide the individual or group an incentive for such added labor, and to remove federal regulations and ownership of such property. US agricultural scientists have the ability to greatly move economical development. However, laws that regulate patent applications, ownerships, and issues surrounding "conflict of interest" have greatly discouraged such processes.

40. Have NRI appropriations been used to expand agricultural research or have they been used to continue existing programs?

NRI has been of tremendous value in moving agricultural research to the forefront of current technology. NRI has been an important vehicle to modernize agricultural research and to provide essential technologies to advance food and fiber technologies in the US. The major problem with NRI is that it has never been funded at the level planned. Actual dollars spent competing for these meager funds probably exceeds funding available.

Agricultural Research Service (ARS) Laboratories

41. Should the USDA have research laboratories or should it provide competitive funding to existing entities such as universities?

At present ARS often tries to be all things to all people. ARS needs to focus and define its primary missions (this would decide to what extent laboratories need to be maintained). ARS should focus on one or two of the following three primary missions: 1) long term research commitments to specified areas-of-emphasis, 2) short term fast response research teams, or 3) competitive funding to land grant universities. The long term research commitment should involve creating a number of research emphasis areas in cooperation with outside agencies. In current ARS structure, long term research commitments are too often sacrificed for short term expediency. The two do not effectively co-exist. Competitive funding is effective to stimulate short term research responses, but may ultimately be detrimental to long term research needs (scientists tend to concentration in areas of funding and ignore other critical but poorly funded topics). ARS may best be reorganized around "areas-of-emphasis" in close association to other research institutions, and to handle short term research needs *via* competitive funding. The areas of emphasis should not be centrally directed from Washington whereas competitive funding of high priority or short term funding should remain in central USDA control.

42. Should more ARS laboratories be co-located at land grant universities? What should be the relationship between ARS and land grant university scientists? Between ARS research coordination? How can ARS laboratory functions be more effectively linked to State Agricultural Experiment Stations?

YES, ARS laboratories should be located in close proximity with major land grant universities! Areas-of-emphasis requiring commitments from both USDA and respective land grant universities should be established Research scientists from both ARS and Universities should have reciprocal benefits and support Both ARS and university faculty need to have mutual access to facilities, equipment, supplies, and personnel support as well as joint appointments ARS personnel and programs should be continuously reviewed by peer groups outside of USDA (as are land grant university faculty and programs) ARS coordination should be directed to the area of emphasis and discipline areas and not be centrally dictated (eliminate National Program Staff control of areas-of-emphasis) Funding incentives should be directed to the area-of-emphasis with priorities going to those with solid cooperative links between ARS and State Experimental Stations Internal ARS research coordination is most critical at the commodity and area-of-emphasis level and less important on the agency as an entity

43. Are ARS laboratory facilities effectively used in performing needed research? If not, please explain and offer suggestions for better use?

ARS laboratories are "redirected" such an extent that cohesive research is often next to impossible Redirection often necessitates massive renovation in facilities and purchasing of specific equipment Laboratories are often redirected faster than these facilities can become productive ARS laboratory facilities should be directed to long term research functions and less to short term "political hot topics" The National Program Staff should be eliminated in favor of more direction from the areas-of-emphasis or discipline groups outside USDA The maintenance of isolated ARS facilities should be reviewed

Extension Service (Extension functions within CREES)

44. The USDA Extensions Services (ES) mission is, among other things, to disseminate research results to farmers and other customers. In your opinion, is the ES effective in carrying out this mission?

ES role in technology transfer of research to farmers has been extensively eroded over the past decade Positions in ES have been transferred to address social issues The demand for ES services, however have never been greater The demand for technology transfer by ES to rural America will also accelerate in the near future

ES services has two types of clientele in the US The small family farm and the consolidated agriculture industries The small family farm has in the past required the ES to function as a generalist ES has effectively served the small producer by fielding questions, and through the publication of new technologies The number of employees in ES with the objective of transferring technology to the small agricultural enterprise has eroded so severely that communication occurs almost exclusively by print The newest technologies will put a high demand on ES in the future

ES involvement in the consolidated industries is evolving The consolidated agricultural industries tend to be well educated and informed They have the means to obtain any expertise needed to improve their efficiency in commodity production ES can best meet the needs of the consolidated industries by intense specialization and serving on a national basis, rather than a state or regional basis

Current Research Information System (CRIS)

51. ARS uses CRIS to provide information about USDA research projects. How, if at all, do you use CRIS?

Very little! CRIS is mostly used internally for USDA administrative and congressional reporting needs but is not very useful outside of USDA. Many universities and independent researchers ignore CRIS expect for preparation of necessary HATCH project paperwork or regional project requirements.

52. In your opinion, is CRIS effective in helping you obtain information on Federal agricultural research projects? If not, what changes are needed to this information system that would provide quality data in Federal and State agricultural research? (Please explain).

Overall, CRIS is not very effective for outside USDA researchers. It appears that CRIS is used primarily as an accounting tool for budget allocations rather than for dissemination of specific research information. It is too large, cumbersome, and vague to be of use to anyone outside of the system. Agricultural research information is more often dependent on discipline or commodity and needs to be specific, not general. Any single all-encompassing information system will not serve highly specific needs for technical information. CRIS serves USDA agricultural administration but does not serve the agricultural scientist, the agricultural community, or the consumer.

53. Is there/should there be an appropriate and adequate management information system(s) in place to report and collate from Federal investments in research, extension, and higher education sponsored by the USDA (and related research agencies)?

USDA should encourage that scientists place an acknowledgment of USDA sponsorship on all publications. A simple tracking of these publications should serve as an accountability to USDA. Reporting on reports would appear redundant and expensive.

54. Does the CRIS system and other USDA reporting systems provide an adequate accounting of the research and extension work that is being done in America?

CRIS provides a duplication of reporting systems. CRIS provides no information to advance agricultural research. In addition, it is not used by agricultural scientists to advance agricultural research. Since it does not advance science, the mere requirement for reporting suggest it hinders the process. Agricultural science is advanced by the participation of scientists in annual meetings and the publication of papers and extension fact sheets. Dollars spent on many of the USDA reporting systems would be more effectively used to support these activities.

55. How can the USDA be most effective in the short and long term through its support of international activities?

In both the short and long term, one of the best assurance that US research can be a value in the global market place is maintain patent protection of its new technologies. Through the assurance of adequate research funding, and encouragement of use of the patent process, USDA will provide valued materials to the global market. USDA must also provide incentives for US agricultural scientists to participate with other agencies in the education of other countries. In addition, as commodity prices stabilize following a lifting of product subsidies, US agriculture products will be positioned for free trade.

In general, ES is overwhelmed in its attempt to service its customer. It is attempting to service to many with its limited resources.

45. Should the ES be involved in addressing the problems and challenges confronting urban populations?

ES was not developed or intended to service urban populations. The placement of such an objective is misguided. Urban problems should be addressed by a separate agency. ES must adhere to its original intent and be flexible in its size depending on demand for its service and value of its activities.

46. What if any role should ES play in dealing with social issues facing farmers and rural communities?

ES must adhere to its mission of disseminating research and technology to rural America. Improvements gained will effectively solve social issues.

47. Should the ES's mission statement be changed to focus activities on production agriculture?

Yes. Technology transfer goes hand in hand with production agriculture.

48. What should ES not be involved in?

Social and Urban issues, apart from agriculture. This should not exclude human nutrition.

49. Do you have any suggestions on how USDA's dissemination of Federal agricultural results can be improved?

Historically, there has been an effective means of dissemination of information to the ES. USDA must focus on using ES as its vehicle to disseminate results.

50. Who is, or will be, responsible for developing a marketing plan for agriculture and its science and education programs to the American people?

The marketing of agricultural discovery through education is primarily conducted by the actual inventor. Extension organizes oral means of presentation and raise monies for meetings, scientists deliver their findings, and extension aid in the publication and summation of these findings. Allied industries are the principle donors to cover cost. Trade journals, working with extension and scientist, further disseminate findings in a manner that is easy to read. This system involving scientists, extension, industry, and the media has effectively evolved as a means of disseminating research results.

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56. Currently USDA and other programs extend agricultural development beyond the nation's borders. What continued and expanded role should USDA play in international research, education, and extension?

Perhaps none. Agencies already exist to accomplish these goals. Assure the availability of USDA scientists to work with these other agencies.

57. What is the role of USAID in funding agricultural research and extension? Has USAID maintained support for agricultural R & D in developing countries in developing new markets for US products? Should USAID contract through USDA/REE for long-term agriculture R & D?

USAID has been effective in its international mission and has been extensively involved in agricultural research and extension. It has been effective in developing markets for US products. There is absolutely no reason for USAID to "contract" through USDA if the USDA will encourage its scientists to assist USAID in its activities. If any contractual arrangement must be established, it should be directly with the research unit. This would allow the research unit to have funds to recover the cost associated with scientific involvement with USAID. Any "contracts" at a higher administrative level will increase the bureaucratic mass and will reduce the actual level of agricultural research being conducted in either agency. Many scientists who are using USDA research dollars are also involved with USAID projects. There seems to be no benefit, with exceptions noted, to change the current method of operation.

Prepared by, Poultry Science Association
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FINAL DRAFT

11/08/95

ENTOMOLOGICAL SOCIETY OF AMERICA

OFFICE OF THE PRESIDENT

MEMORANDUM

To: Dr. John Goldberg

From: Eldon E. Ortman, President

Date: October 30, 1995

This letter is sent in response to the issues posed by Representatives Pat Roberts, E (Kika) de la Garza, Wayne Allard and Tim Johnson.

The Entomological Society of America is the largest Entomological Society in the world having over 8,000 members employed in industry, academia, and government. They work as consultants, researchers, educators, and regulators. Insects are pervasive, thus entomologists work includes a broad arena, for example, insects that transmit human and animal disease as well as pests that are destructive in food and fiber production. Permit me to cite just two critical issues in which entomologists had a major role — Lyme disease transmitted by ticks is second only to AIDS in spread across the U.S.; white flies and fruit flies have seriously impacted our ability to produce a quality food product thus presenting a significant deterrent to productivity and competitiveness of U.S. food and agriculture sector. Support for research and education has paid excellent dividends to the nation and will continue to pay dividends to the extent that we invest.

In developing a response to these most important questions posed by the Honorable Representatives we have solicited membership input with document development and review by the Governing Board of the Society. We are pleased to have this opportunity to contribute to the information base in support of the Farm Bill development.

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Enclosure

Agricultural Research, Education and Extension

Questions for Discussion

A. Federal Agriculture Research Goals

Entomological Society of America (ESA) supports the position that there is a significant role for the federal government in agricultural research. Issues facing agriculture are pervasive; thus, goal setting in agricultural research must involve a holistic approach. Quite directly as it relates to ESA, pests and other related problems transcend political boundaries and thus must be addressed on a larger scale than state, county, or local political arenas.

It is important for goals in agriculture to be coordinated with the research activities of other federal agencies involved in research as well as the state and federal partnership, the land grant institutions. Given that clientele and partnerships are of critical importance in agriculture, federal agricultural research goals should be set through the participation of affected clientele, public and private constituency. Further, planning should also involve those public and private institutions that provide information, service, technology, and products to the broad agricultural sector.

The state/federal partnership in the land grant institutions and ARS has served agriculture in an exemplary way as witnessed by the rarity of crop and animal pest and disease crisis and the low cost and high quality of food and fiber available to the nation.

Basic knowledge provides the foundation for the solution of agriculture and environmental problems. Federal support in funding scientific, cutting-edge research is crucial to realize the benefits of science for the public. Further, the application of that basic knowledge to the benefit of the citizenry must be a clear goal of the federal government and its partner institutions, the land grant universities. Federal research goals should include provisions for supporting fundamental research, the payoff for which is not always recognized nor immediate. Further, the integration of technologies and information into an operational management system must have public support to recognize the benefits of fundamental research.

B. Priority Setting

Most, if not all, state agriculture experiment stations have several types of advisory committees that involve constituents, including producers, processors, and consumers. Various research funding entities, such as commodity check-off programs, also insure that producer ideas and views are incorporated into the research and extension priority development process.

Priorities in research, education, and extension should portray a balance between the functions of research and education as well as a balance in the research program between that identified as fundamental and applied or problem solving. Fundamental research, generally more generic, frequently draws on funding from other sciences and agencies and focuses on developing basic knowledge that forms the foundation for developmental and problem solving research. It is crucial that this base provide continuing building blocks for applied research. A fundamental research program is driven by developments in science and should reflect a broad base of support, agriculture, as well as other science and discipline areas. National and regional priorities should impact the problem solving and developmental research agenda which represents the most important arena for the involvement of producers and consumers in identifying program development.

Most agriculture research is a long-term effort and quantum leaps in benefit from research are infrequent. When quantum leaps occur, one can virtually always demonstrate that the advance was based on a combination of a well-developed fundamental knowledge with long-term commitment to application.

Although basic research may benefit from some mission orientation, it is also most important and appropriate that there be a willingness to support high risk, exploratory research that has the potential to lead to major breakthroughs or the potential to lead to nothing.

It is most crucial that research have a strongly supported and well-developed infrastructure, a system for moving fundamental discovery to the development and utilization mode.

Various agencies in USDA have a regulatory or more legal role. Development of any regulatory plan or action must have a sound foundation in science. Providing that scientific foundation is a role of the Agriculture Research Service (ARS). Also, State Agricultural Experiment Stations may be called upon to provide fundamental scientific information to enhance the regulatory role of other agencies within USDA as well as other governmental entities such as EPA. A regulatory program that is not based on sound science will not be in a position to best serve the citizens of the nation.

A prime role for Cooperative States Research Education Extension Service (CSREES) in its new structure is to be integrative, to be a facilitator, to be a coordinator. A prime role for CSREES in 1995 - 2002 would be to serve as a facilitator between various entities that generate information, those entities that need information, and those entities that desire have a basis for contributing to the public agenda of the research and education process.

The development of integrated systems and programs will require the best efforts of both public and private sector. It is not a role for any single unit, entity, or state. It must be a collaborative activity with multiple players. CSREES should play a facilitating and capacity building role.

C. Advisory Boards

There is a need for multiple level and multifocused advisory boards in order to effectively explore the research and education needs in agriculture. It is most important to have advisory boards to assure that research retains an appropriate focus and relevancy in order to serve the citizen, the taxpayer who is paying the bill. Great attention and care must be given to the selection of Advisory Board representation to be assured of a cross-section of ideas and interests. Advisory Boards are viewed as having two broad roles — advising on broad policy matters and advising on specific priority targets for research and education programs.

The most direct impact of an Advisory Board activity on research and education directions and goals will come at the state and regional level where the input will be more specific and problem oriented. At a national level an Advisory Board must represent such a broad, diverse, cross-section that the advice becomes highly diffuse and diluted. National commodity organizations represent alternative national forums for advisory activities.

D. Funding Considerations

The appropriate mix of funds from formula to competitive, from basic to applied will vary according to the nature and area of the research program. Thus, once goals and a research program are established, a careful assessment can and must be made to identify the appropriate mix of funds required to achieve the goals and objectives of an identified research initiative or developmental enterprise. The federal government must be the primary source of funding support for basic research. Formula funds to land grant institutions are most important and need to be sufficient to maintain the fundamental infrastructure in order to respond to problem-solving research needs as well as to pursue opportunities in basic research.

Competitive funding through grant programs is optimized when there is a strong institutional infrastructure. This infrastructure must have a base of long-term, dedicated resources. Formula funding is vital to ensure a continuity in infrastructure. Without that continuity, it will not be possible to respond to impending and existing problems/crises in agriculture, and to develop new as well as to modify existing technologies and approaches to meet the changing demands imposed on agriculture. Further, it is crucial that there be a continuity of funding for the systematic and uninterrupted data collection on natural systems and phenomena (for example, weather, environment, etc.). This is essential to assess and develop agricultural systems that are economical and environmentally benign. Although this is not cutting-edge science it is nevertheless crucial to optimizing the potential impact of scientific discovery for the public good. It is this continuous, base-line data that make it possible to put discovery into practice, into a system, and determine if and how discovery is improving society.

Accountability requirements must recognize that there are different goals and purposes for different types of research ranging from the basic to the highly developmental programs. Although it is important to have accountability, it is also most important to balance accountability with the cost of achieving an accountable approach. Accountability requirements should not be of the type and level that stifle creativity and discourage investigators from following a highly risky research agenda which, however, may have the potential of leading to significant breakthroughs or making those quantum advances.

One approach that might be considered for developing accountability in a program would be to require scientists, to establish benchmarks that they would recommend be used in documenting progress toward expected outcomes or goals. That is, identify benchmarks against which progress could be measured. This might become a part of a proposal development.

Many research issues or problems, for example, related to insects are of a regional nature. Thus, it is appropriate that there be a regional focus for a competitive grant process particularly those addressing problem solving.

Generally facilities, i.e., brick and mortar, are matters that should be funded by an individual institution, i.e., the state for example. However, one of the major arenas in which the federal government should play a critical role would be in the development of capability within laboratories, for example, a grants program for equipment modernization. The cost of technology and analytical equipment are advancing at such a rapid rate, that it is most difficult to maintain state-of-the-art facilities. Scientific equipment is a critical issue for the research and education programs. Equipment to be used in educating the next generation is in need of upgrading in most institutions. It is an arena that should be considered for investment of federal resources.

Commodity check-off funds are an important element in research and education support. There may be some growth in these funds in the future, but they are generally closely linked to very specific marketing or research interests of a commodity group. Check-off funds do not contribute significant resources to fundamental research. These programs more frequently support short-term as opposed to long-term research. It is important to examine how these commodity funds can be efficiently used as a part of the total agricultural research funding base. Generally, this is best done at the state level where commodity funds are managed and awarded. Commodity group representatives should be involved in the planning process of various institutions including federal.

E. Delivering Agricultural Research

A key to the improvement of research information delivery is better coordination between agencies that deliver information to producers and practitioners. It is important to establish a coordination base between all agencies including CSREES, ARS, etc. .

It would be most appropriate for the USDA to have a state-of-the-art information management system that would facilitate the timely input, distribution, and retrieval of information. The system must serve several purposes and will require critical consultation in design and development.

The key issue in delivering agricultural research is the formation of effective partnerships that are mutually beneficial. Partnership bases will be defined by issues, problems, and the program under consideration.

One of the key matters in international competitiveness is the availability of a well educated and trained workforce. This must be a high national priority, one in which the federal role is critical. To discharge this role, the federal government must create a unique partnership with the state land grant institutions in the area of education programming. The educational activity needs to have curriculum enhancement assistance from K - 12 to include development of materials and programs to create an understanding of agriculture, food, and natural resources. The key to success in this area is furthering the partnership between the land grant institutions and the federal government. Food, agriculture and natural resource education must be broad, not directed only at the "elite," but targeted to enhance the understanding and competency of the general populous.

There needs to be a significant commitment to the exploration and use of appropriate new technologies in the delivery of information to the user clientele as well as the general public.

F. Land Grant Universities

The land grant universities have a unique role in creating new knowledge and combining that development with the educational program in a single institution. This combination of discovery and learning sets education in a land grant university apart from institutions in virtually every other country in the world. Land grant universities are thus prime contributors to our world leadership in agriculture, therefore, should be nurtured and enhanced.

Attention to regional research programs has become a higher priority of State Agriculture Experiment Stations at many planning meetings. Many aspects of research are best served by regionalization which results in pooling scientific expertise among the various research entities such as the land grant universities. The current regional research programs provide an excellent model for regional and inter-regional activity. It is a sound, well-founded concept that transcends state boundaries and should be enhanced to optimize research.

In looking toward regionalization, it is important to remember that problems occur at local levels; thus, it is crucial to maintain a local capacity to respond to agricultural and natural resource issues. Agricultural production is highly site-specific particularly with crop production. Thus, there is a continuing need to give specific attention to the variability occurring due to environments, soils, etc. Increasing knowledge about the impact of management practices coupled with advanced commodities technology indicate that site-specific farming will be a watchword for the future. Development of site-specific farming will involve cooperation in a broad arena (for example, technology development) as well as experimentation at very local levels. Both can be accommodated by creating new and effective partnerships.

The encouragement of consortia and partnerships and the enhancement of the existing regional research infrastructure is particularly important during times of constrained resources. It is important to recognize the differences among duplication, replication, and redundancy.

G. National Research Initiative

Basic research in the sciences related to agriculture has been significantly enhanced through the National Research Initiative (NRI) by adding to the store of basic knowledge that is important in the agriculture and natural resource sector. Enhanced funding for NRI, however, should not be achieved at the expense of on-going applied agricultural production and natural resources research and extension programs. NRI program funding might be enhanced through the diversion of "pork barrel" funding for items such as building construction or through greater scrutiny of entitlement programs.

There is a significant need to fund developmental research that bridges the gap between the fundamental research funded by NRI and the implementation of that research. This developmental research, sometimes identified as the "valley of death" between basic research and implementation would benefit significantly from a major infusion of resources to insure the continued competitiveness of American agriculture. Such an initiative might also be launched through an off-set of entitlement or commodity programs.

H. Agricultural Research Service Laboratories

These laboratories have contributed significantly to science and to the advancement of agriculture and natural resources. It is important to have laboratories with a national focus, for example, National Animal Disease Laboratory, National Soil Erosion Laboratory, National Seed Storage Research Laboratories and Utilization Laboratories. This need for national centers can probably be best served by ARS. However, ARS also has a number of small laboratories with remote locations that might be best amalgamated with national centers or State Agriculture Experiment Stations in order to achieve a critical scientific personnel mass and more effective operation. Ideally, ARS and State Agriculture Experiment Stations should have well-coordinated, colocated programs serving specific regions. Colocation can be beneficial to both entities in terms of critical mass of scientists as well as the reduced cost of infrastructure support facilities. Excellent linkages and working relationships between ARS and the land grant universities can be identified. Further joint strategic planning and programming would optimize collaborative programming and maximize resource utilization.

I. Extension Service Function

The Agricultural Extension Service, a major factor in the success of U.S. agriculture, is primarily a state and local government directed and funded entity. This source of support contributes to the variability in Extension's operations, effectiveness and accomplishment across the country.

The Extension Service should focus its primary efforts in the area of agriculture and natural resources. The information and expertise developed in this process, for example, information on horticultural plants and turf management, is relevant to and should be made available to the suburban and the urban population.

Agricultural extension employees trained in leadership development represent a significant cadre of expertise that is valuable to all sectors of society. However, with current funding constraints, the extension service should critically review the breadth of its involvement. One of the potentially most productive ways for Extension to share its knowledge and experience is through forming critical partnerships with other agencies and services to provide information, resources, training, and expertise.

This would be in contrast to direct involvement in conducting of programs with the population at large. The Extension Service should be creative in developing unique partnerships that will provide expertise that enhances or facilitates other agencies to meet the needs of the greater population.

The Extension Service provides a vital link between practitioners and producers and a research enterprise. This link enables Extension to provide input and to identify issues in prioritizing research.

J. Dissemination of Research Results

The key to dissemination of research results is identifying and utilizing the most appropriate technology for the issue, the audience, the problem to be addressed. User-friendly electronic data bases, accessible via E-mail, Internet, or the World-Wide Web, should continue to be established and maintained. Currently, many institutions are struggling to develop and maintain effective systems. Most institutions and funding agencies are primarily interested in creating new systems. It is most difficult to identify resources to be used in maintaining highly useful services. The federal government needs to invest in the maintenance of critical services that are the basis for providing important information resources.

In the marketing of agriculture research, science, and education programs, it would be desirable to develop collaboration with the private sector, with those entities that have developed effective marketing programs. In today's high-tech media, it is critical that programs be of high quality, be attractive, and have an excellent marketing component in order for the information to reach the intended audience. The development of a marketing plan needs to involve the end user communications experts, as well as those having the information resource.

K. Current Research Information System

CRIS is useful as a record system, a repository of information. Given today's computer technology and information systems capability, CRIS is no longer adequate to provide the critical output needed to answer producer questions, congressional inquiries, etc. There is a critical need for a state-of-the-art information system on an electronic data base with broad accessibility for timely sharing of research information in formats useful to scientists and citizens.

L. International Relations

GATT and NAFTA virtually dictate that the USDA must expand its roles in international programs, but these programs must be selected with great care. There are many reasons for involvement in the international scene, for example, grain quality standards, germplasm exchange, and biological organism movement. Further impacts will occur as agriculture commodity support programs are reduced and as a competitive global marketplace expands. The USDA and the land grant system will play an increasingly critical role if U.S. agriculture is to maintain its international competitiveness. To maintain that international competitiveness and to promote U.S. agriculture in a most advantageous way, federal and state research, extension administration personnel must understand the production systems as well as the political and environmental systems in other areas of the world.

The funding of international research and education extension programs should always be examined for mutual benefit. Though trade-offs may not be immediate or direct, they should be long-term goals of all international programs. In the agricultural sector of the long-term global economy, the United States is both a debtor and a contributor nation. The United States gains by obtaining biological resources from other nations, and in return U.S. scientists have benefited other nations by the enhancing those materials and returning both knowledge and enhanced materials to other countries.

USAID appears to have ceased or greatly curtailed funding to production agriculture and related programs. The development of GATT and NAFTA and the importance of maintaining a U.S. competitive situation suggests that funding USAID projects would be significant in positioning the U.S. agricultural enterprise.

Entomological Society of America
October 28, 1995
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INSTITUTE OF FOOD TECHNOLOGISTS
THE SOCIETY FOR FOOD SCIENCE AND TECHNOLOGY

DANIEL E. WEBER
Executive Director

November 9, 1995

Dr. John J. Goldberg
House Committee on Agriculture
1301 Longworth House Office Building
Washington, DC 20515

Dear Dr. Goldberg:

The Institute of Food Technologists (IFT) appreciates the opportunity to assist the House Agriculture Committee in its analysis of federal funding of food and agriculture research. To that end, IFT submits the enclosed report addressing the Committee's 57 questions for discussion of agricultural research, education and extension.

As a nonprofit scientific society with 28,000 members working in food science, technology and related professions in industry, academia and government, IFT is keenly interested in the federal government's efforts to meet future food, agriculture, environmental, and rural development needs through an improved system of research funding. IFT convened a working group of representatives of academia and industry and obtained input from senior scientists within USDA to develop responses to the Agriculture Committee's questions. Members of the working group are identified at the back of the document.

Your willingness to extend your deadline enabled IFT to develop more substantive answers to the questions and is, therefore, greatly appreciated. We look forward to additional opportunities to assist the Committee in this important endeavor.

Sincerely,

Frank Busta

Frank F. Busta, Ph.D.
President

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Response to the U.S. House of Representatives
Committee on Agriculture
Agricultural Research, Education, and Extension
Questions for Discussion

by

The Institute of Food Technologists

EXECUTIVE SUMMARY

- USDA must lead in:

  1) setting goals and priorities for food and agricultural research and communicating those goals to the scientific community;

  2) encouraging collaborative research among government agencies, academia, and industry;

  3) funding long-term, high-risk food and agriculture research problems that the private sector cannot or will not undertake;

  4) enhancing the coordination of federal and state efforts in food and agricultural research and education;

  5) providing data on the future needs for people trained in food and agricultural sciences and supporting the training of such people.

- Federal agricultural research is a primary source of information for policy and regulatory decisions by USDA and other Federal agencies; it provides the scientific knowledge needed to meet the challenges of food and agriculture production, processing, storage, and utilization; and it underlies the development of new technologies critical to sustaining agricultural production and economic competitiveness.

- USDA and the Federal government must be a mentor, partner and sponsor of food and agriculture research.

- Federally funded agricultural research must pay more attention to the needs of processors and consumers such as food safety, health, value-added technologies, and environmental issues.

Executive Summary, cont'd

- The Land Grant University system is as necessary as it has ever been. This system must broaden its focus and interactions beyond agriculture production to encompass producer, processor, consumer, environmental, economic, community, national, and international interests in food and agriculture.
- The National Research Initiative Competitive Grants Program (NRI) has expanded agricultural research, enhanced the development of a strong, technically based agricultural science community, and elevated food and agricultural research within the U.S. scientific community. If it is to fulfill its potential, the NRI must be fully funded as originally intended.
- Advisory boards must include broad perspectives from users, rather than focusing mainly on agricultural production issues. Improved coordination among advisory boards and the inclusion of interdisciplinary perspectives will improve the visibility and effectiveness of advisory boards.
- Research evaluation and impact must justify the funding of short and long term programs.
- USDA must improve the electronic delivery of information about government research and extension programs.
- The CRIS information system must be updated to keep pace with current PC, Internet and World Wide Web capacity.
- The Extension Service should be communicating to researchers the intermediate- to long-range problems facing producers, processors, and consumers and translating the latest research findings into useful information for local clientele.
- International food and agricultural research efforts should be strengthened. USAID and USDA efforts to collaborate in research and demonstration projects in developing countries will advance the agricultural, social, and economic welfare of developing countries.

FEDERAL AGRICULTURE RESEARCH GOALS

1) *What should be the role of the Federal Government in agricultural research?*

The Federal government must be a mentor, partner, and sponsor in the food and agriculture research arena, encouraging research consortia, and providing organizational leadership among university, industry, private interest, and government research scientists, as well as supporting the training of future food and agricultural research scientists. The Federal government should provide leadership to encourage collaborative research. It should identify, select, and support both fundamental and applied research that assures the safety and enhances the nutritional quality of the food supply, protects the environment, sustains the productive capacity of the U.S., and expands the role of the U.S. in the global economy.

2) *To what extent should goal setting and goals in agricultural research be cognizant of and coordinated with research activities in the rest of the Federal research sector (HHS, EPA, DOE, etc.)?*

Goal and priority setting among Federal research agencies depends on improving communication among the USDA services and between USDA and other Federal agencies. The Office of Science and Technology Policy must serve its purpose in coordinating the large agencies that are involved. A Federal science policy that recognizes the need for fundamental and applied research on food and agriculture must result. This will happen only if agencies involved with food and agricultural research accept their responsibilities in the larger effort.

3) *Is the process associated with the Food Animal Integrated Research for 1995 (FAIR '95) adequate for the development of Federal agriculture research goals? Area there goal identification processes which might better serve to enhance Federal agricultural research other than FAIR '95?*

The intent of FAIR '95 was commendable and the goal essentially was reached. A similar process can be used as a model for other organizations since the key points are to secure all viewpoints, treat everyone as equals in nondirected discussion and debate, and finally, insist on obtaining a workable consensus.

4) *If the process of FAIR '95 were to be used to adopt an agenda for Federal agricultural research, how would the goals identified in FAIR '95 and listed below, need to be modified to address the concerns of all research stakeholders?*

1) *Enhance industrywide responsiveness to consumer and societal concerns;*
2) *Meet market demands through increased efficiency and competitiveness;*
3) *Develop integrated food animal management systems;*
4) *Maintain and enhance environmental quality;*
5) *Improve food quality control in terms of safety, desirability, and nutritional composition; and*
6) *Enhance animal well-being throughout the life cycle of food-producing animals.*

The goals appear excellent and straightforward, in particular for the food animal industry. Specific goals from other food and agricultural research interests, such as those from the fields of microbiology, toxicology, plant and soil sciences, aquaculture, food processing, nutrition, and others should be obtained to develop comprehensive food and agricultural goals. The first goal listed above appears to lie outside the scope of food and agriculture research, though may have its own merit.

PRIORITY SETTING

5) *Is Federally funded agricultural research focused on the issues of highest priority for producers, processors, and consumers? If not, how can the priority setting mechanism be improved to insure that these issues are addressed?*

Federally funded agricultural research traditionally focuses on priorities of producers, such as increasing crop yields. More attention to the needs and priorities of processors and consumers, such as value-added technologies, health, food safety, and environmental issues, is warranted. Establishing specific research goals within competitive grant programs, and including more representatives expressing food processing, safety, health, environmental, and consumer concerns in selecting and evaluating research goals, will enhance the treatment of these issues.

6) *Should Federally funded agricultural research address specific technological and industrial needs? If yes, does the present system fulfill this goal (if not, please describe how this can best be accomplished)?*

Yes, federally funded agricultural research should address specific technological and industrial needs. The traditional producer perspective has made it difficult to relate processor and consumer needs to the ultimate quantity and quality of the U.S. food supply. This perspective has meant that strategic planning and priority setting pays too little attention to the technological needs hampering improvements in food safety, quality, nutrition, and environmental protection.

7) *Does Federal agricultural research adequately address projects that result in quantum leaps in benefits, or does it dwell too much on incremental benefits?*

Federally funded research dwells too much on incremental benefits and too little on funding "quantum leap" research. Food scientists have not been sufficiently involved in the visionary process of setting research priorities. "Quantum leap" research is difficult to identify in advance and is often the outcome of decades of fundamental scientific achievement, no single component of which could foreshadow "quantum leap" developoments.

8) *What is the appropriate role for USDA/REE in ensuring competitiveness in the face of decreases in price support programs?*

Price supports stifle innovation, competition, and research. Free market competition rewards short-term innovation at the expense of long-term commitment. USDA/REE must place priorities on research with intermediate to long-term benefits to food producers, food processors, and consumers, emphasizing aspects such as quality, safety, and innovative technologies to add value.

9) *How can the appropriate Federal-State-Industry resource pools be integrated to develop high priority regional programs in research, teaching, and extension?*

Federal-state-industry participants must reach a common understanding and consensus on the value and priority of specific multidisciplinary research goals. Convening visioning conferences to achieve a common knowledge base and guarantee broad participation is a first step. Incentives that include Federal resources, state and industry matching resources, and responsiveness to regional priorities must be integrated into regional programs in research, teaching, and extension.

10) *How important is the Federal agricultural research role in supporting other agencies of USDA? Of other Federal agencies? Could this be done more efficiently and at lower cost?*

Federal agricultural research is a primary source of information for policy and regulatory decisions by USDA and other Federal agencies. It also provides the scientific knowledge needed to meet the challenges of food and agriculture production, processing, storage, and utilization. Federal agricultural research also underlies the development of new technologies critical to sustaining agricultural production and economic competitiveness. Although there have been suggestions to combine regulatory, policy, and research functions under common umbrellas, research should be separated from the political pressures typical in regulatory and policy agencies.

11) *USDA reorganization created the Cooperative State Research, Extension, and Education Service (CSREES). In your opinion, how should this newly configured agency function to support the U.S. agricultural enterprise, 1995-2002?*

CSREES should continue to function as liaison between USDA and the land-grant university system, representing university interests and perspectives of agricultural research, teaching, and extension to Federal partners, and representing Federal partner interests and perspectives to the universities. CSREES should work with universities to ensure that properly trained people are available to sustain and enhance the U.S. agricultural enterprise. Participation of universities in setting agricultural research and education priorities should be expanded. Collaboration between universities and the Federal government should be further enhanced. Land grant universities represent an important but underutilized resource to USDA and the Federal government. CSREES should more aggressively encourage collaboration. CSREES should work with ARS to explore opportunities ofr government-university-industry consortia to set priorities for food and agricultural research needs and to solve complex problems.

12) *What is the proper place for integrated systems programs? What role should the Extension Service (extension functions within CSREES) play in these programs?*

In the world outside of government, integrated systems provide real answers to real problems. The Extension Service should be communicating to researchers the intermediate- to long-range problems facing producers, processors and consumers and translating the latest research findings into useful information for local clientele. Successes occur due to bonds established between extension specialists and research scientists, but extension and research bureaucracies often make such integration difficult.

ADVISORY BOARDS

13) *Have USDA's research and extension advisory and coordinating boards been effective in planning and prioritizing agricultural research and extension? (please explain)*

Advisory and coordinating boards have not been sufficiently visible in planning and setting priorities for agricultural research or extension programs. Board membership must include broad perspectives from users, rather than focusing mainly on agricultural production issues. Improved coordination among advisory boards and the inclusion of interdisciplinary perspectives will improve visibility and effectiveness.

14) *How have research or extension priorities been changed as a result of the recommendations of advisory boards (please provide examples)? Are there presently too many advisory boards?*

Advisory boards have incorporated environmental concerns in planning and setting priorities for research programs. Fewer advisory boards, however, would suffice. Advisory boards should have representatives with broad interest, experiences and perceptions to achieve a truly multidisciplinary approach.

15) *What options should Congress consider to improve USDA's process for planning and prioritizing agricultural research? (i.e. how should the research agenda be prioritized?)*

Including all interested parties and reaching a consensus on agricultural research priorities are difficult but worthwhile goals. Consensus conferences on agricultural research priorities, such as the recent NSTC forums, and written comments from broad constituencies similar to FDA requests for comments on proposed legislation, could be useful approaches. Scientific and technologic needs as well as economic impacts, all related to the primary goals established by USDA, should be the main drivers for the research agenda.

16) *What role should stakeholder advisory boards play in setting the agenda? What groupings should be represented on advisory boards? Can "customers" and "partners" be accommodated on one board or will it require two?*

Input from broad-based advisory boards is necessary to identify, validate, and garner support for research agendas. Advisory board priorities maybe narrowly focused, however. Sorting and setting priorities requires broadly focused, interdisciplinary and cross-commodity input. Useful inputs can be obtained from advisory boards, but consensus requires appropriate representation, cooperation, negotiation, and compromise.

17) *Is there a special role for advisory boards to play in international agriculture beyond what has occurred in the past?*

Advisory boards must be cognizant of relationships among domestic and international agriculture, marketing, and trade. Advisory boards must be aware of international politics, economics, and circumstances. Experienced, assertive international participants can contribute substantially to the deliberations of national advisory boards.

FUNDING CONSIDERATIONS

18) What is the most appropriate mix of Federally funded basic and applied agricultural research?

The distinction between basic and applied research is difficult, indefinite and often meaningless. Fundamental (basic) research produces knowledge that may have broad applications and must be funded by Federal monies. It is critical that publicly funded research address long-term, high-risk problems that the private sector cannot or will not undertake. Research investment by the Federal government should result in stronger multidisciplinary research. The original allocation of NRI research funds is appropriate but the total available funding is inadequate to accomplish the objectives of the NRI.

19) How, if at all, can the effectiveness and efficiency of agricultural research be enhanced at current funding levels? At reduced funding levels?

The effectiveness and efficiency of agricultural research might be enhanced with improved communication within the USDA and among Federal agencies, as well as with state governments and private groups. Consensus is needed on research goals, strategic objectives, and priorities. Reduced funding will seriously impair research and problem-solving capabilities.

20) How can future funding be determined and justified so as to permit multi-year programs to be completed?

Future funding must be based on evidence that progress toward measurable objectives is occurring annually. Funding sources should support individuals and teams within defined programs following demonstration of satisfactory progress, require strict guidelines for responses to requests for proposals, require progress reports consistent with objectives, and base future funding on performance and progress.

21) *In view of the growing emphasis on greater accountability of Federal expenditures, do you have any suggestions as to how agricultural research results can be measured and their impact evaluated? Is there some standard of accountability for the efficient and effective use of federal research funds?*

The impact of research can be measured in what is achieved, developed, or produced. It may be years, however, before research findings are translated into demonstrable results. Such a time lag makes it difficult to measure and evaluate research results effectively. In the short term, however, showing how research results contribute to new understandings, point the way to new research inquiries, and contribute to technological development and problem solving will give evaluators information for putting research programs into perspective. Relating research findings to strategic directions of research programs will also aid in research evaluation. The results of specific projects can be evaluated qualitatively by peer evaluation within the framework of expected outcomes from the proposed research. Proposed research should include explicit indicators or evaluation indices whenever possible.

Basic research may be evaluated by publications and citations and appropriate narrative responses. Applied research can sometimes be evaluated by achievement of objectives and economic impact. Promulgation and implementation of the Government Performance and Results Act will provide a tool and frame of reference for accountability in the use of Federal research funds.

Dr. Thayne Dutson, Director of the Oregon Agricultural Experiment Station, has developed a computerized database called "Oregon Invests" documenting the economic, environmental, and social impacts of Oregon funded research. This database is a ground-breaking effort to explain, account for and assess the value and contribution of state-funded research to meeting scientific and social needs.

22) *What is the proper balance between in-house, formula funds, competitive grants, and special grants?*

Strict quotas for each type of research ignore needs of different disciplinary perspectives. In-house and formula funds are useful when they address issues such as nutrient composition that are not "hot" but are important for the continued well-being of producers, processors and consumers. The Federal government must continue its partnership with the states in supporting the food and agricultural infrastructure as well as research programs and education. Over-reliance on these funds, however, may breed complacency and may inhibit innovation. Competitive funds stimulate innovation and the development of new knowledge, but exclusive reliance on these funds may reduce the availability of funds needed for innovative applications. Special grants have the potential to address specific topics that require urgency (such as a serious foodborne disease outbreak by an unknown agent) but have considerable potential for political abuse. Special grants do not necessarily ensure the highest quality research or address the highest priority needs.

23) What guidelines should be used in determining appropriations for "specified programs" in research, education, and extension?

The guidelines for determining appropriations for "specified programs" should be aligned with other programs for peer review and evaluation. Urgency, priority, and necessity may contribute to guidelines requesting research proposals and appropriations to support explicit objectives and research plans. "Specified programs" should be related to the goals and strategic objectives for research, education, and extension.

24) Should Federal funds be used for programs only, or for facilities as well? If for facilities, how should they be allotted - competitive proposals or other? Is there a place for regionalizing research, increasing competitive grants, etc.?

Federal funds should mainly support research programs, with support designated for facilities limited to clearly justified needs. Funding for facilities should be awarded on the basis of fairness and need.

Research targeted to meeting regional needs has merit, but clear goals must be developed and communicated to scientists and administrators. Review of regional research program impact, productivity and funding is necessary. Utilization of regional research appropriations in interdisciplinary competitive research programs that cross state lines may be more effective and efficient.

25) Is there a place for partnerships not only with state and local public sector organizations and industry, but also with private foundations?

There is a place for partnerships among Federal, state, and local agencies, industry, and private foundations. Such partnerships will be restrained by the funding guidelines of each partner, yet should be encouraged to expand the support for accomplishing research objectives of mutual interest.

26) *To what extent do self-assessed "check-off" fees on commodities provide resources for research and education? Do these/should these programs support long-term research, as opposed to short-term product development and promotion research?*

Self-assessed "check-off" fees provide marketing and research funding primarily to individual states. Commodity funding currently supports research priorities set primarily by producers and directed at long-term production objectives. Self-assessed "check-off" fees are best targeted at industry-wide problems across commodities, rather than at the short-term needs of individual or few producers. Progress of the research should be evaluated annually according to specific objectives, with funding awarded on a year-to-year basis.

DELIVERING AGRICULTURAL RESEARCH

27) *In order of priority, what would be the most significant actions USDA could take to improve its management and/or delivery of agricultural research?*

- Set priorities for research needs
- Enhance the coordination of federal and state efforts in food and agricultural research and education.
- Improve the communication among USDA services and between USDA and other Federal agencies
- Employ electronic communication technologies to improve the cataloging, reporting, dissemination, and utilization of research results (i.e., technology transfer
- Improve the integration of research and extension efforts

28) *What options should Congress consider to improve the delivery, results, and benefits of Federally funded agricultural research?*

The delivery, results and benefits of Federally funded agricultural research could be improved by more effective and timely dissemination of research findings to a broader base of users. Increased use of electronic means of dissemination can assist in accomplishing this objective. The goal should be more rapid technology and information transfer to scientists and user groups, so that the results can be disseminated and used more effectively. Efforts to communicate the benefits and success of food and agricultural research to the public must be substantially increased.

29) *What should be the Federal role in insuring training of future work forces for the food and fiber needs as well as the natural resource concerns of the public?*

The Federal government should provide reliable data on future needs for people trained in the food and agricultural sciences. Training should be coupled with competitive, peer-reviewed scholarship/fellowship programs such as the National Needs Fellowship Program and the Challenge Grants Program. Federal research awards should include funding to support and train postdoctoral fellows, graduate and undergraduate students interested in research on agricultural production, food safety, quality and processing, and natural resource conservation. Federal research awards will encourage and help individuals pursue careers in the food and agricultural sciences, and will stimulate innovative teaching.

LAND GRANT UNIVERSITIES

30) *What is the continuing role of Land Grant Universities? 1890's Colleges? 1994 Colleges?*

The need for the Land Grant University System, with its emphasis on teaching, research, extension, and international programs, is as great as it has ever been. However, this system must broaden its focus and interactions beyond agriculture production to encompass producer, processor, consumer, environmental, economic, community, national and international interests in food and agriculture. These universities and colleges must bring the total spectrum of their expertise to society through research, education, extension, and international programs in order to maintain the domestic success and global stature of America's food and agriculture research enterprise.

31) *Is the current formula used to allocate Federal funds to land grant universities fair, reasonable, and does it address changing conditions? If not, how could it be improved?*

The formula used to allocate Federal funds to land-grant universities may not be fair, but it is reasonable. Allocation of funds using a population basis does not recognize excellence, but does result in states with small populations having access to such funding. Since such funding forms the base of regional programs, it enables small land grant institutions, who could not effectively compete with their large, highly successful research counterparts, to receive funding vital to their programs. Funds to land grant universities facilitate research on local and regional agriculture problems that might otherwise not be addressed and as such provide vital support for regional economies.

32) The land grant universities have a system of agricultural experiment stations in each state. In today's environment of Federal and State fiscal constraints, is such an extensive system of research stations still warranted (please explain)? Could certain functions be merged with other USDA agencies, other Federal agencies, etc.?

State agricultural experiment stations are experimenting with enhanced research collaboration and consolidation. Both leadership at the Federal level and coordination among states are needed to provide more efficient and productive distribution of funds and programs without shortchanging the needs of individual states. In particular, states may increasingly need to work together on solving state and regional agricultural problems in order to make more efficient and effective use of dwindling research dollars. Better integration of agricultural experiment station and Federal agency functions can assist in facilitating interstate cooperation. Improved communication among states and between states/regions and Federal agencies, with continued involvement of the land grant colleges and universities would be expected to smooth eventual transitions.

33) How can agriculture research be best coordinated among Federal, State, and private institutions?

Coordination mechanisms currently in place involving regional and national councils of agricultural research scientists and administrators, and a national database system for agricultural research are working quite well. The biggest gap is coordination between USDA-ARS and the USDA cooperative state agricultural research programs. Consolidation needs to protect the research focus on local and regional research needs.

A data system containing up-to-date information on research objectives as well as current and expected outcomes of Federal and State research projects offers the greatest opportunity for coordination. Private and foreign institutions can be encouraged to participate. Initiation of some variation of the database on Internet may be the best opportunity for effecting this collaboration.

34) What models currently exist, and are in use to provide regional cooperation in research and extension?

The USDA supports Regional Research projects, encourages the organization of clusters of research scientists with like interests, and promotes productive cooperative research through collaborations that might not otherwise occur. Regional Research funding seldom provides direct support for research scientists or research programs. National and regional meetings organized by scientific societies provide opportunities for interchange of information and potential research collaborations.

35) In the current era of constrained resources, is it appropriate to use Federal funds to promote cooperative regional research to reduce unnecessary duplication; and to what extent is it appropriate to use Federal funds to encourage consortia of states to establish individual centers of excellence to address common problems?

Far too much time is wasted in ferreting out duplicative research and avoiding the appearance of research duplication. A more efficient use of resources is to encourage innovative research by stimulating competition among university programs. The development of regional consortia has merits when the consortium is based on science or problem needs not political considerations. A still better approach is to fund specific projects that are competitive, span state lines and academic disciplines, and have expiration dates.

Using Federal funds to promote cooperative regional research and establish Centers of Excellence may be appropriate. Equitable distribution of funding is feasible; equitable distribution of sites of Centers of Excellence may result in regional and political quarrels.

36) As societal concerns about natural resource use, rural development, animal well-being, etc. are integrated into the USDA agenda, is there a role for "new" partnerships with the Federal sector?

Absolutely, but the new research-based partnerships must be built on scientific objectives, not on politically correct, formula-based awards. When appropriate, social and agricultural sciences may need to be blended. Evaluation of proposals needs to include administrators with broad vision, and social and food/agricultural scientists for ensuring technical merit. At the present time there are no good links between the vision and the evaluation phases of the process.

37) Other parts of the Federal Government sponsor research directly applicable to the food and agriculture system. The National Science and Technology Council is intended to address the coordination of related activities across agencies. How is this intended to work in the case of research and extension on food and agriculture? How well is it actually working? Are alternative methods needed?

The National Science and Technology Council (NSTC) should be an effective mechanism to address the coordination of food and agricultural research activities across Federal agencies. The NSTC, if supported, could actively coordinate among federal agencies research discussions, priority-setting, and innovative research initiatives. The NSTC is designed to serve the purpose of the proposed Department of Science.

NATIONAL RESEARCH INITIATIVE

38) *Congress authorized the National Research Initiative (NRI) Competitive Grants Program at $500 million per year. If the NRI is to be fully funded, where in the USDA research budget could money be transferred from?*

The National Research Initiative (NRI) Competitive Grants Program elevates food and agricultural research within the U.S. scientific community and is the catalyst for strongly supported basic and applied food and agricultural research programs. The NRI, if it is to fulfill its potential, must be fully funded as originally intended. Within the current USDA research budget, formula funds must be maintained; thus special or regional research funds are potential alternatives for enhanced NRI funding.

39) *What other options for funding the NRI should Congress consider?*

- Funds currently available as commodity price supports
- Funds currently used for conservation payments
- Funds allocated to research on human health

40) *Have NRI appropriations been used to expand agricultural research or have they been used to continue existing programs?*

The NRI appropriations are expanding agricultural research. The greatest contribution of the NRI has been to enhance the development of strong, technically based, subdisciplinary groups within the agricultural science community. The greatest shortcoming has been to ignore the need for mission-linked research, and to fund innovative research that has scientific merit but is outside the focused interests of the evaluation panels.

AGRICULTURAL RESEARCH SERVICE (ARS) LABORATORIES

41) *Should the USDA have research laboratories or should it provide competitive funding to existing entities such as universities?*

The USDA-ARS laboratories should strengthen their collaborative research with state educational institutions and agricultural research centers to promote research opportunities and cooperation between government and academic scientists. Cooperative Federal, state, and private sector scientists can work together to compete for multidisciplinary research funding.

42) Should more ARS laboratories be co-located at land grant universities? What should be the relationship between ARS and land grant university scientists? Between ARS research coordination? How can ARS laboratory functions be more effectively linked to State Agricultural Experiment Stations?

Research linkages between ARS scientists and universities need to be developed and strengthened, especially where ARS facilities are not closely associated with a university. A greater collaboration between the two systems would benefit both organizations. In the age of electronic communications and sharing information, collaborative relationships will increasingly be based on common scientific interests. In addition, ARS research programs could benefit from systematic evaluation using peer review teams composed of scientists both within and outside the government.

43) Are ARS laboratory facilities effectively used in performing needed research? If not, please explain and offer suggestions for better use?

Effective performance depends on the quality of the research program, technical support and facilities, and the individuals involved. Federal investment in ARS research is frequently effective, cutting edge, and in the national interest. ARS research programs would benefit from close collaboration with universities where such interactions are weak and infrequent. Systematic peer review by teams of scientists from inside and outside government will also strengthen the quality of ARS research programs.

EXTENSION SERVICE (EXTENSION FUNCTIONS WITHIN CSREES)

44) The USDA Extension Service's (ES) mission is, among other things, to disseminate research results to farmers and other customers. In your opinion, is the ES effective in carrying out this mission? (please explain)

Yes. The remarkable accomplishments of US agriculture are directly attributable to the ongoing pursuit of the ES mission. Nutrition is an area in whiche information transfer targeted at a specific group has been successful. ES has not always used some of the latest information tools, such as expert systems, models, and decision aids as effectively as possible. Future success rests on continued understanding of customer needs and the ability to communicate through nontraditional forms such as electronic databases. There is need for greater utilization of economic research applications in ES applications. It must be clearly defined who are the "other customers" for ES in order to prevent the ES mission from becoming too broad and unfocused.

45) Should the ES be involved in addressing the problems and challenges confronting urban populations?

Yes. The USDA Extension Service (ES) programs should better utilize information technologies to reach its clientele more effectively.

46) What if any role should ES play in dealing with the social issues facing farmers and rural communities?

The USDA Extension Service (ES) should work with rural/social systems to enhance the appreciation, value, and economic viability of the agricultural system in the community. ES can improve its dissemination of information about the economic importance of the agricultural system and the advances in agricultural technology that make farming viable. ES should be actively involved in bringing information about the advances in agricultural technologies into the community education system. Undue overlap in the ES mission with other social services may dilute the effectiveness of ES programs and undermine its ability to achieve its primary objectives relating to the dissemination of food and agriculture knowledge.

47) Should the ES's mission statement be changed to focus activities on production agriculture?

The USDA Extension Service (ES) mission should not focus exclusively on production agriculture. The ES mission should integrate production agriculture with post harvest food and agricultural technologies as part of the entire food system.

48) What should ES not be involved in?

ES should focus primarily on achieving its food and agriculture objectives among its key target groups specified in its mission.

DISSEMINATION OF RESEARCH RESULTS

49) Do you have any suggestions on how USDA's dissemination of Federal agricultural research results can be improved?

More extensive use of electronic communications will help achieve more timely and effective dissemination of Federal research results, especially if the skills of scientific communicators and technical writers are used.

50) *Who is, or will be, responsible for developing a marketing plan for agriculture and its science and education programs to the American people?*

Marketing plans for agriculture should be developed by a consortium of representatives from the food and agricultural industries, government, and academia. Such a consortium should include representatives from trade associations, commodity groups, food processors, marketing specialists and consumer/user groups. Marketing plans should be contemporary and include the needs of the consumer. Agricultural science and education programs should be developed by consortia of land grant institutions, government, and industry working on a regional basis. Professional and scientific societies, consumers and other user groups also have important contributions to offer to the educations programs, particularly those targeted to consumer and lay audiences. Communications specialists must be part of the education and communications team.

CURRENT RESEARCH INFORMATION SYSTEMS (CRIS)

51) *ARS uses CRIS to provide information about USDA research projects. How, if at all, do you use CRIS?*

Unfortunately, the CRIS data retrieval system often contains less than acceptable descriptions of research progress. Searching the published peer reviewed literature is more rewarding than the time spent preparing or retrieving CRIS progress reports.

52) *In your opinion, is CRIS effective in helping you obtain information on Federal agricultural research projects? If not, what changes are needed to this information system that would provide quality data on Federal and State agricultural research (please explain)?*

CRIS is useful in obtaining an historical perspective, but tends to be out of date before reaching the computer screen. The CRIS system is helpful for obtaining information about ongoing unpublished agricultural research projects within the USDA and Land Grant University Agricultural Research Centers. Additional quality information could be generated by encouraging CRIS abstracts to be more specific and less technical. Generalities and jargon prevail too often. CRIS classification system needs to be modified to include new research categories and technologies such as biotech and IPM etc.

53) Is there/should there be an appropriate and adequate management information system(s) in place to report and collate results from Federal investments in research, extension, and higher education sponsored by the USDA (and related research agencies)?

A management information system that could truly increase the efficiency and effectiveness of disseminating research findings would be welcome. Past attempts have merely increased the reporting burden of scientists without improving the process. Very careful consideration is needed to make such a system useful.

54) Does the CRIS system and other USDA reporting systems provide an adequate accounting of the research and extension work that is being done in America?

The CRIS and other USDA reporting systems do not provide an adequate or timely accounting of allocations or results of USDA or other Federal research or extension work. The CRIS system does as well as can be expected under the circumstances, but the system appears to be burdened with too many functions evaluation, information, etc. Until we can develop true measures of research productivity in the areas of basic, applied, and mission-linked projects, how can we design a reporting system that adequately accounts for research programs? Adequate accounting measures must be developed first.

INTERNATIONAL RELATIONS

55) How can the USDA be most effective in the short and long term through its support of international activities?

USDA is most effective in international activities when it maintains high standards of basic and applied research; these serve as models worldwide. USDA will maintain high standards in research by setting priorities for its research goals, objectively and openly evaluating research progress according to standard criteria, and assuring scientists and taxpayers that the quality of food and agricultural research in the USA is excellent. Through leadership and participation in international food and agriculture research and program activities, USDA contributes to the development of international research projects with governments, universities, companies, and scientists around the world. Emphasis on contributing food and agricultural research results to developing countries is often inappropriate for the needs of the host country. Research programs targeted to the priority needs of developing countries are most useful. USDA needs to support the education of people from developing countries in the agricultural sciences, with assurance of the application of their learned technologies in the home country.

56) *Currently, USAID and other programs extend agriculture and agricultural development beyond the nation's borders. What continued or expanded role should USDA play in international research, education, and extension?*

The US is currently a leader in agricultural research. Such work is important in feeding a hungry world, developing overseas markets, and interacting with scientists from other countries. The U.S. needs to make every effort to share its technologists, educate scientists outside the U.S., and foster collaborative research programs. As developing countries advance, they offer increased economic opportunities for trade with the U.S.

57) *What is the role of USAID in funding agricultural research and extension? Has USAID maintained support for agriculture or has the agency moved away from agriculturally related programs? What is the role of long-term agriculture R&D in developing countries in developing new markets for U.S. products? Should USAID contract through USDA/REE for long-term agriculture R&D?*

International food and agricultural research efforts should be strengthened. With reduced budgets USAID is reducing its international agricultural programs in developing countries. USAID must focus its programs where they will have the greatest impact. Incorporating "sociological" research into research projects will strengthen the effectiveness of the investment. USAID and USDA efforts to collaborate in research and demonstration "technology transfer" projects in developing countries will advance the agricultural, social and economic welfare of developing countries.

Institute of Food Technologists' Working Group Response to House Agriculture Committee Research, Education and Extension Questions

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Plus
Several senior scientists from
different agencies within USDA

ASAE

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November 1, 1995

The Honorable Pat Roberts
Chairman, House Agriculture Committee
1301 Longworth House Office Building
Washington DC 20515

Dear Chairman Roberts:

The American Society of Agricultural Engineers appreciates the opportunity to respond to the 57 Questions that were distributed for comment. The response of our Issues Management Committee is attached. We welcome the opportunity to provide this input into the process of developing the Research Title of the Farm Bill.

ASAE's 8,000 members are involved in all aspects of agriculture and are vitally interested in the best investment of our limited resources in the research, teaching and extension. We recognize that you will receive many responses and are ready to assist you in your evaluation of these, should you wish to call on us. Additionally, if the opportunity to provide testimony occurs, we would be pleased to respond to your needs.

As the integrators of technology in agriculture, agricultural engineers are very supportive of holistic approaches to solving today's complex problems. We trust that our responses will be helpful to you as you evaluate the proper investment in the great agricultural system in our country, with a goal of making it even better.

Sincerely,

Roger R. Castenson
Executive Vice President

dt

Enclosure

American Society of Agricultural Engineers Responses
to
Research Related Questions from the U. S. House of Representatives, Committee on Agriculture

November 1, 1995

Federal Agriculture Research Goals:

1. What should be the role of the Federal Government in agricultural research?

The federal government should work closely with the National Association of State Universities and Land Grant Colleges (hereinafter referred to as NASULGC) and it research related component, the Experiment Station Committee on Organization and Policy (hereinafter referred to as ESCOP) to provide leadership in defining the needed agricultural research to provide new knowledge and technology to solve problems that will continue to arise. The federal government should continue and enhance its partnership with the states in the distributed system of research, extension, education and international development, all of which have had high rates of return. This includes the intramural research programs of ARS both in separate facilities and especially in university campus sites, where cooperative efforts are optimized. Opportunities for three-way cooperation with industry also should be sought.

Agricultural research addresses problems and opportunities which may be quite location specific, regional or national in scope. Federal research should: a) address regional and national issues that cannot be appropriately addressed by states or private industry; b) work on high risk and/or multi-disciplinary problems that are not easily addressed at the local level or by industry; c) work in very specialized research that is of national priority but may not be cost effective by industry or state research programs i.e. control of killer bees or sustainable ag systems.

The federal government should evaluate the projected benefits of research before projects are initiated and should further assess the impact(s) of the findings in meeting the initially stated goals.

2. To what extent should goal setting and goals in agricultural research be cognizant of and coordinated with research activities in the rest of the Federal research sector (HHS, EPA, DOE, etc.)?

An effective coordination of planning and evaluation of research partially or fully funded from federal sources should be a continuing process. This will include an acute awareness of related research funded by states and other non-federal sources. The coordination process often should include agencies besides USDA, because the production, processing and marketing of agricultural products related to other issues such as health, environmental quality and international competitiveness. Also, as research issues become increasingly complex, there frequently is a role for other sciences often not included in the usual Agriculture related units in universities. In addition, research conducted or contracted for by other federal agencies often is highly relevant and important to agricultural issues.

3. Is the process associated with the Food Animal Integrated Research for 1995 (FAIR '95) adequate for the development of Federal agriculture research goals? Are there goal identification processes which might better serve to enhance Federal agricultural research other than FAIR '95?

FAIR '95 focused on bringing together for discussion and planning those interested in consumer needs, production and environmental concerns with the scientific community. The purpose was to address the various agendas and to reach a consensus of the importance of the issues. FAIR '95, however, focused on animal agriculture. Also, it may have missed some important regional/local inputs. Therefore, it would not appear to be an acceptable model for all commodities and non-commodity research needs. Local interactions of the above groups with the recommendations aggregated at the national level would seem to be a better approach. To a great extent this is what is done in developing the ESCOP/CSREES (formerly CSRS) planning recommendations.

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ASAE'S RESPONSES TO 57 RESEARCH RELATED QUESTIONS

4. If the process of FAIR '95 were to be used to adopt an agenda for Federal agricultural research, how would the goals identified in FAIR '95 and listed below, need to be modified to address the concerns of all research stakeholders?

1) Enhance industry wide responsiveness to consumer and societal concerns;
2) Meet market demands through increased efficiency and competitiveness;
3) Develop integrated food animal management systems;
4) Maintain and enhance environmental quality;
5) Improve food quality control in terms of safety, desirability and nutritional composition; and
6) Enhance animal well-being throughout the life cycle of food-producing animals.

We recommended that FAIR '95 not be used directly as a model. While it provides a beginning, it's focus is too limited to only animal related agriculture. Some procedures from it might be used in developing a process more suited to overall rural agricultural, social and environmental issues.

Priority Setting

5. Is Federally funded agricultural research focused on the issues of highest priority for producers, processors and consumers? If not, how can the priority setting mechanism be improved to insure that these issues are addressed?

Federally funded (in total or in part) research is not and should not be focused on the "issues of highest priority for producers, processors and consumers." These are important but the research agenda overall (described as a portfolio by some) must include both the shorter term needs of those mentioned, but also the longer term needs of that group, but which are not recognized at the present time. Research programs must be flexible enough to discontinue research which has reached an impasse and to initiate research when fundamental studies have opened a window of opportunity previously unrecognized. This can not be achieved by central edict, and must be developed through wise delegation to the local level.

The priority setting process certainly can be improved. Efficient and effective ways to receive input from "stakeholders" and then to discuss and prioritize is needed. Perhaps user/customer conferences have a role. Also, the Extension system (especially at the County level), which has close daily contact with the user/customer community, should be involved in these conferences, but also in continuing daily/weekly feedback to their research counterparts. Many of the university based extension personnel currently hold part time research appointments.

6. Should Federally funded agricultural research address specific technological and industrial needs? If yes, does the present system fulfill this goal (if not, please describe how this can best be accomplished)?

Federally funded research historically and appropriately has been that research which has been considered too risky for industry to initiate, but for which there appeared to be opportunities for quantum breakthroughs, but also of unknown time frame. Many of these have been invaluable to American agriculture. This practice should continue.

Research to develop products from principles from research and highly location specific research probably should be funded from other sources. At the same time there should be funding from multiple sources over the spectrum of research from application through early discovery. The federal government should participate in all levels.

7. Does Federal agricultural research adequately address projects that result in quantum leaps in benefits, or does it dwell too much on incremental benefits?

This is not an "either/or" situation. Scientific progress is built on both incremental steps and major breakthroughs. Many, perhaps most, "quantum leaps" have a relationship to findings from incremental research. However, it does appear that the federal government probably is underinvesting in discover oriented research more likely to result in quantum leaps. E.g., the National Research Initiative (hereinafter referred to as the NRI), which is discovery/break through oriented is funded at only one fifth of the authorized level.

8. What is the appropriate role for USDA/REE in insuring competitiveness in the face of decreases in price support programs?

Price support programs currently provide an assured minimum income for farmers and ranchers. Other programs have provided protection against unusual and unexpected weather conditions and pest populations. If these programs are reduced or eliminated and GATT and NAFTA make the international markets more competitive, then REE along with the States must replace the losses and offset the increased competition with new knowledge and technology that will reduce the biological and economic uncertainties of farming, ranching and processing. Research and extension to enhance international competitiveness over both the short and long terms must be conducted and should receive priority by REE. This includes development of agricultural policy that will enhance competitiveness, yet be fair to all of the world. At least a portion of any saving from the reduction of supports, should be invested in programs suggested by the Agricultural Competitiveness Initiative.

9. How can the appropriate Federal-State-Industry resource pools be integrated to develop high priority regional programs in research, teaching and extension?

Funding provided by states primarily address issues important to the state. Industry and commodity groups invest in research aimed to produce profits for their constituencies. Federal funding most often focuses on issues of national priority with some directed to areas of greater uncertainty. Previously established tax incentives for industry to invest in research could be restored with language to encourage integration with public research activities. REE and the states could develop a procedure similar to ARS and its CRADAs. Examples of some currently reasonably well integrated programs are: Regional Research (a part of Hatch funding), Integrated Pest Management (IPM) programs and Sustainable Agriculture Research and Education (SARE) programs. Perhaps Extension could be used to survey and report customer needs and to help establish regional action committees to promote the needed integration.

Regardless of what is done an integrated approach to research is required. Today's problems are too complex to be solved by single disciplines; multi-disciplinary teams of researchers are required to provide holistic solutions.

10. How important is the Federal agricultural research role in supporting other agencies of USDA? Of other Federal agencies? Could this be done more efficiently and at lower cost?

ARS interacts considerably with other USDA agencies and conducts and/or interprets its research to meet the needs of the action agencies. We believe that research findings of the state also often could be interpreted to meet some of these needs. CSREES could play an important role here in bringing together the relevant state researchers with action agency personnel and even occasionally in developing a contract, when the state(s) has the greatest competency to meet the action agencies needs.

There also appears to be excellent opportunities for two way sharing of information and possibly contracting with the Environmental Protection Agency (EPA), the Department of Health and Human Services (HHS), the Department of Interior (DOI), the Department of Energy (DOE), the Department of Defense (DOD) and perhaps others.

11. USDA reorganization created the Cooperative State Research, Extension and Education Service (CSREES). In you opinion, how should this newly configured agency function to support the U. S. agricultural enterprise, 1995-2002?

In the recent reorganization of USDA to form CSREES, the Congress recognized (at least accepted the premise) the need for an agency within USDA to deal with effective operation of the **unique** partnership existing between the states and the federal government for agricultural research, extension and higher education. A principle role of CSREES is to help implement the integration of the many components of the partnership to make effective and efficient use of the limited resources. This should focus on the partnering with and not administering to the members of the Land Grant university system. The process should include the direct involvement of personnel from the Land Grant universities, who are intimately familiar with problems and needs at the local levels. As indicated by the legislative language of the bill establishing the new agency, there should be active participation of the state partners (education, extension and research) in policy and decision making process in the Undersecretary's office.

12. *What is the proper place for integrated systems programs? What role should the Extension Service (extension functions within CSREES) play in these programs?*

Systems research has application across the broad spectrum from application to discovery, but generally more to the former. It is desirable for extension personnel to be closely involved in the application systems research, because they will play a major role in its adoption and utilization. It is important to recognize that integrated systems often, perhaps usually, have components that were developed independently to solve part of a problem. Often more rapid progress can be made by developing components and then integrating them with minor modifications. For this reason no attempt should made to generalize as to what part of research/extension these efforts should be assigned. Make the judgments depending upon what is known and available and from those data, who is best qualified to move forward. There currently are several examples of effective integrated systems applications from combined research/-extension efforts. Some of them are: IPM, Water Quality, Sustainable Agriculture, Integrated Resource Management (IRM), etc.

Advisory Boards:

13. *Have USDA'S research and extension advisory and coordinating boards been effective in planning and prioritizing agricultural research and extension ? (please explain)*

USDA's advisory boards of the past have been marginally useful at best. They do not represent the grass roots stakeholders. We attribute this to the fact that several of the members have been appointed on a political basis rather than a background and experience basis. Customers and partners on the same board seems advisable, but such a combination will require skillful leadership and not just a support staff. Advisory boards probably need to meet regionally, where interests are more common, before the come together at the national level.

14. *How have research or extension priorities been changed as a result of the recommendations of advisory boards (please provide examples)? Are there presently too many advisory boards?*

One can not cite with certainty changes made in research and extension priorities, because of advisory board actions or recommenoations. However, members of these boards often also serve on state advisory boards, where they likely influence decisions because they are intimately familiar with local issues. These decisions definitely feed forward in the Land Grant systems planning processes. Often the advisory board indicate strong concurrence with at least some of the priorities that evolve. Examples of this are environmental quality, value added through processing, food safety and nutrition, etc. Because of the complexity of agriculture, more than one board would seem to be needed.

15. *What options should Congress consider to improve USDA's process for planning and prioritizing agricultural research? (i.e., how should the research agenda be prioritized?)*

Congress should provide a mechanism to get industry and production agriculture (the farmers) involved in the planning and prioritization of agricultural research. Goals at the federal level should maintain a balance of long term, basic and applied research. Closer cooperation of USDA with the agricultural and biological science societies should be considered in planning for agricultural research.

16. *What role should stakeholder advisory boards play in setting the agenda? What groupings should be represented on advisory boards? Can "customers" and "partners" be accommodated on one board or with it require two?*

Stakeholders for a considerable time have been very closely involved in setting research agendas at the state level. To some extent these also have integrated to the regional level and then to the national. Advisory board membership needs to include the following groups: consumers, utilizers of the research/extension, manufacturers, processors, marketers and distributors, producers, environmentalists, social agencies, and probably others. It would not seem possible to integrate these efforts with a single board. Therefore, a number of subgroups would appear to be needed with their efforts flowing into one or more boards at the national level. With current electronic technology these boards do not always have to meet physically in a single location. In fact, much of the effort could be handled with out the members leaving their local office.

17. *Is there a special role for advisory boards to play in international agriculture beyond what has occurred in the past?*

It would be more desirable for whatever boards are created to be given a international charge as well as the other(s). We need to find a way to involve foreign nationals in our international agriculture policy decisions. Select these people based upon their experience in the U.S. in purchasing our products. These people know their own culture and most know considerable about ours. This enables them to tell us what their citizens desire in product attributes, packaging (including size or number in a packaging unit), etc. that U.S. marketers often overlook. We also should not overlook the role of assisting developing countries advance their own agriculture, so they will have currency with which to buy some of our products. However, our development efforts should not be confined only to agriculture, but to some industrial development at the appropriate level.

Funding Considerations:

18. *What is the most appropriate mix of Federally funded basic and applied agricultural research?*

As indicated previously the federal government needs to take a lead in the basic research/higher risk areas. Applied research, while often considered to be very site specific, frequently can have much broader application, if the principles are delineated rather just taking an experimental approach of trial and error. There appears to be a clear cut deficiency in basic research, because research capacity overall has decreased in recent years. However, applied research should not be decreased at this time to fund basic research. Savings from other programs and linkages with other agencies and groups should be the current source(s) for the more fundamental studies.

Several surveys have shown that less than 10% of federal research is aimed at systems or multi-disciplinary research. Many key agricultural issues (i.e. non-point source pollution, precision farming, etc.) are not being addressed well by federal programs because federal programs fail to address applied, multi-disciplinary problems. We suggest more involvement of industry in the prioritization and planning process.

19. *How, if at all, can the effectiveness and efficiency of agricultural research be enhanced at current funding levels?*

First, it is important to recognize that research capacity has decreased in recent years and the number of groups seeking assistance has increased. Most of the flexibility to redirect has been expended. Agricultural research at this time is efficient. Perhaps its effectiveness might be enhanced through more multi-state (at least two adjoining states) to regional or even national efforts. Some of the regions are so large (experiment station defined Southern and Western, e.g.) that it would difficult for scientists from all states to participate at a single location, which has been suggested by some. However, as previous noted, electronic technology permits conferencing and sharing of information without being at the same location physically. It would seem useful to direct some funding to analyzing procedures to conduct research effectively at one location to serve the needs of several states. However, to be fully useful, likely some research would still need to be conducted locally to validate fully the findings of the single location. Perhaps some of this could be done by extension personnel, who would be helping put the findings into use.

20. How can future funding be determined and justified so as to permit multi-year programs to be completed?

To provide better support for research, especially the longer term efforts, improved methods of planning and goal setting is necessary. These include ex ante and ex post analysis of the results of research. USDA also needs a more complete reporting and management system that links and integrates with state systems. However, planning and reporting must limited, so they don't require more effort and funding that the research that needs to be conducted. Hatch funding with an approximate 4 to 1 match by the states overall has served a useful purpose for multi-year research.

21. In view of the growing emphasis on greater accountability of Federal expenditures, do you have any suggestions as to how agricultural research results can be measured and their impact evaluated? Is there some standard of accountability for the efficient and effective use of Federal research funds?

Several significant studies have been conducted to estimate the returns on investments in research, both ex ante and ex post. These have show very significant internal rates of return. Some have chosen to disbelieve these findings, but none of the disbelievers have offered anything better yet. Often it is difficult to put a monetary value on some research, e.g., that with social or environmental impacts and also the fundamental, where the future application is not totally clear and may not be possible without further fundamental studies. We recommend peer evaluation for quality and usefulness as well as ex ante, where it seems appropriate.

22. What is the proper balance between in-house, formula funds, competitive grants and special grants?

No consensus ever would be possible among the administrators or the performers of research across the whole system. It does seem quite clear that as much in-house research as possible should be conducted on university campus to enhance cooperation. These locations virtually always have better libraries (admittedly now almost anything can be accessed electronically) and a number of competent scientist with which to interact. Additionally, the location of scientific equipment at university site make possible fuller utilization of it. While it is nearly impossible to indicate the balance, we suggest that no one segment be greater than one third and that all scientists in the system be eligible to compete for all funds. Both in-house and formula funds are literally competed for by scientists in those agencies/universities. There aren't enough funds to adequately support all of the needed research. Certainly, if you must have balance, it is not equal shares.

23. What guidelines should be used in determining appropriations for "specified programs" in research, education and extension?

It is not clear to us, what "specified programs" is intended to mean. Perhaps the following criteria would fit most situations, even if they were classified as extremely urgent, i.e., emergency or bordering thereon:

a. User identified need
b. Evidence of significant progress toward resolution of the issue
c. Importance of the problem nationally
d. Capability of the scientific community to resolve the issue
e. Priority of the issue in the Strategic Plan(s) of the agencies
f. The impact of resolution on the people of the nation/region/perhaps world

24. Should Federal funds be used for programs only, or for facilities as well? If for facilities, how should they be allotted - competitive proposals or other? Is there a place for regionalizing research, increasing competitive grants, etc.?

We believe that the major emphasis for support using federal funds should be programs with equipment receiving some consideration. There is a need for funds for facilities as well, but it would be wiser to ask the states to provide the facilities, except in unusual circumstances. Should federal funds be used for facilities, they should constitute no more than one third and preferably no more than one quarter of the total.

Research currently is regionalized to some extent using the Regional Research funds. Perhaps your question addresses placing research for a single purpose at a single location. If so, this should receive some consideration, but only if a number of different locations were selected for a number of different issues.

25. *Is there a place for partnerships not only with state and local public sector organizations and industry; but also with private foundations?*

Some such partnerships already exist or have existed mostly in the international development area. These partnership of the future should be created with as many entities as are interested and have something to contribute in personnel and/or funding. Foundations likely will prefer to partner with a single educational institution or other public entity to simplify the management and priority setting.

26. *To what extent do self-assessed "check-off" fees on commodities provide resources for research and education? Do these/should these programs support long-term research, as opposed to short-term product development and promotion research?*

Check-off funds generally are of the magnitude that they are most useful in supporting or possibly extending on-going research. Only infrequently are they large enough and of sufficient duration to initiate a new program. Often, extending involves activities that will bring the research findings into use at an earlier date. Some industries direct virtually all of their check-off funds to promotional activities. The procedures involved in soliciting and in distributing check-offs usually provide for good communications between the industries and the researchers. In the case of University research programs, often the producers gain a sense of ownerships in the programs which they help support.

Delivering agricultural research:

27. *In order of priority, what would be the most significant actions USDA could take to improve its management and/or delivery of agricultural research.*

Two recent actions, the reorganization of USDA and the Government Performance and Results Act (GPRA) are steps in the right direction, but the latter must not be applied to extremes. There is a need for a management information system that can retrieve rapidly information that can be used effectively in the technology transfer process. The Land Grant system needs to be intimately involved in the development of the system, especially extension personnel who would use it to deliver information and enhance adoption of newly developed superior practices. Distance education likely can plan an important role in delivery of information. Extension personnel should be active participants in development research.

Delivery would be improved greatly with more cooperation among agencies i.e. between extension and NRCS, between ARS and food inspection service, between NRCS and EPA, etc. Often individual agencies take a very narrow view of problems that should involve broad-based input.

28. *What options should Congress consider to improve the delivery, results and benefits of Federally funded agricultural research?*

Congress' best opportunity will be in writing of the next Farm Bill (Title XVI). It can mandate changes/initiation of an effective management information system, new and effective structure/membership for advisory committees and the use of Land Grant system personnel in policy development roles. The latter should involve full time participation as IPAs (Intergovernmental Personnel Act).

29. *What should be the Federal role in insuring training of future work forces for the food and fiber needs as well as the natural resource concerns of the public?*

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The federal government should have little direct involvement in higher education, except to provide seed funding for graduate fellowships and for minority programs at both the collegiate and high school levels. These awards encourage good students to pursue agricultural science fields. There should be complete flexibility to use ARS and CSREES funds to support graduate education in both Universities and ARS Laboratories, especially those located on University campuses.

Land Grant Universities:

30. What is the continuing role of Land Grant Universities? 1890 Colleges? 1994 Colleges?

The continuing role of the Land Grant universities is to serve the citizenry of each's state in the best possible way in providing: higher education, continuing education and research finding. Role changes in the Land Grant universities are evolutionary, not revolutionary. There are a number of studies and analyses in progress to provide insight for enlightened change to best serve the constituencies. There is concern that the Land Grant institutions located in the lesser populated states will not be able to maintain standards because of reduced funding. The same concern exists for agriculture related programs in those institutions. A number of programs with lesser enrollments have been eliminated necessarily, **but** this effectively deprives a number of people from pursuing that major. The desired major may be offered in another state, but the costs of going out-of-state frequently are prohibitive. The 1890 institutions with few exceptions are having some of the same problems as the smaller 1860 universities. The facilities grants for the 1890s have been very valuable to them and should be continued. The future of the 1994 institutions is basically uncharted at this time. The Congress should make certain that the number of programs be initiated gradually and that quality be established immediately and continue to be maintained.

The land-grant universities should continue to produce qualified personnel, both research and outreach, conduct essential research, and deliver relevant information to end users. The continuing role of all three land-grant universities/colleges should be to focus on the needs and issues of people regardless of ability to pay.

31. Is the current formula used for allocating Federal funds to land grant universities fair, reasonable, and does it address changing conditions? If not, how could it be improved?

It is difficult to state unequivocally that the current formula is wrong, but consideration needs to be given to assessing its applicability today. It will be difficult, if not impossible to devise a formula that addresses changing conditions. A more realistic approach would be to mandate periodic review and updating (perhaps at 5 year intervals), if needed. In these times it might be improved by including information beyond agricultural statistics, although those should continue play a major role.

32. The land grant universities have a system of agricultural experiment stations in each state. In today's environment of Federal and State fiscal constraints, is such an extensive system of research stations still warranted (please explain)? Could certain functions be merged with other USDA agencies, other Federal agencies, etc.?

It is important to recognize that the states make/made the decision to have experiment stations. Initially, there was the federal incentive of funds to be matched. Even though the incentive still remains, it is a minor portion of the individual experiment station's budgets. Collectively, the states match each Hatch dollar with four or more. There also are other federal funds that come to states, but overall the federal portion is estimated to be no more than 25% and in some state as little as 10% or less.

On the issue of merging, it would seem far wiser to consider merging some of the federal programs into the universities rather than the reverse. The citizenry in general want more state decisions and less federal. Also, responsibilities for a number of issues are being slowly transferred (in some cases **unloaded**, if you will) to the states. An excellent example of joint university(state)-federal cooperation(not officially merged) are the ARS research programs located on university campuses and at branch stations. The personnel work closely together, many ARS personnel have adjunct faculty appointments, the university purchasing departments and business units assist the ARS units, there are joint research efforts and joint publications, and the synergy is superb. In several situations extension programs also are linked.

Several states have discussed the issue of merges for experiment stations. These kind of discussions should be encouraged. There are duplicative state land grant programs that exist within 100 miles of each other. Centers of excellence need to be divided up among these institutions to avoid duplication. In looking at the agricultural industry, almost all major sectors have greatly consolidated during the past two decades. Both the land grants and the federal labs can benefit from the same.

33. *How can agriculture research be best coordinated among Federal, State and private institutions?*

Coordination may not adequately describe the kind of linkages that are needed to obtain the most effective and efficient research results. Certainly coordination is important, but it also must include communication and cooperation. It must not be top down mandates of what is to occur. Also, there must be a major effort to consolidate further federal with state efforts, **and** state with state efforts. It would not appear possible to consolidate private efforts with federal and state efforts, but there should be a way to provide useful linkages and interchanges.

34. *What models currently exist, and are in use to provide regional cooperation in research and extension?*

Regional research is one method of cooperation that is reasonably effective and provides an excellent vehicle for communication among scientists with similar interests. The planning results in different scientists/research stations working on different subprojects of the overall projects. There also are several multi-state efforts, especially where the universities are in close proximity. E.g., Washington and Idaho have several cooperative efforts and each has responsibility for a commodity; Washington does the swine research and Idaho does sheep research. Washington and Oregon have cooperative efforts in extension. A Washington dairy specialist works in Oregon and an Oregon food science specialist works in Washington. The wheat and potato research programs are well coordinated among the three states. There also are numerous cooperative efforts in IPM, SARE, etc. programs.

35. *In the current era of constrained resources, is it appropriate to use Federal funds to promote cooperative regional research to reduce unnecessary duplication; and to what extent is it appropriate to use Federal funds to encourage consortia of states to establish individual centers of excellence to address common problems?*

It certainly is appropriate to continue to use federal funds to promote cooperative regional research. The results from past programs have been outstanding and useful. States have considered consortia and some have been established particularly relating to international program activities. Likely a group of 2-3 states involved in an effort will be more effective than a consortia of many, because needs and interests are likely to be more common.

36. *As societal concerns about natural resource use, rural development, animal well being, etc. are integrated into the USDA agenda, is there a role for "new" partnerships with the Federal sector?*

Yes, there would appear to be. Many of these groups already come to the states and federal government with prioritized research issues. Some come with some funding, or at least are willing to assist in obtaining it. Unfortunately, some come in a totally adversary mode. The Land Grant system has been working diligently to hear these people out and to move them to a client/partner role.

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37. *Other parts of the Federal Government sponsor research directly applicable to the food and agriculture system. The Nation Science and Technology Council is intended to address the coordination of related activities across agencies. How is this intended to work in the case of research and extension on food and agriculture? How well is it actually working? Are alternative methods needed?*

The NSTC will be effective only if it willing to receive input from the Land Grant university system. So far, no input has been sought of which we are aware, and it appears to have operated only internally. Based upon what has not happened to date, we believe that alternative methods are needed immediately.

National Research Initiative:

38. *Congress authorized the National Research Initiative (NRI) Competitive Grants Program at $500 million per year. If the NRI is to be fully funded, where in the USDA research budget could the money be transferred from?*

The funds to fully fund the NRI must not be taken from the formula fund programs. A possible source would be savings from a reductions in commodity support programs. Findings from research that could be supported using these savings would help make producers and processors more efficient and would offset at least partially income losses from the discontinuance of the supports programs. Some of this is proposed under the Agricultural Competitiveness Initiative.

39. *What other options for funding the NRI should Congress consider?*

The only other option that seems possible at this time is funding from savings in other parts of government. This would not seem likely to happen.

40. *Have NRI appropriations been used to expand agricultural research or have they been used to continue existing programs?*

The question seems a bit ambiguous. Most SAES research scientists have their salaries paid from state funds. NRI funds permit them to expand their priority research activities by supporting additional technical staff and graduate students. Both play major roles in increasing productivity of scientists. In addition, the NRI funds are used to help with the purchase of needed equipment and supplies. We know of no instances where NRI funds have been used to replace literally state and other funds.

Agricultural Research Service (ARS) Laboratories:

41. *Should the USDA have research laboratories or should it provided competitive funding to existing entities such as universities?*

USDA has way too many laboratories. Several need to be consolidated. Pork legislation has built many of these labs, and few have been adequately staffed. Consolidation and properly staffing remaining labs could lead to significant improvements.

In the future ARS should not build more laboratories, but work out arrangement with Universities. Some of this could involve competitive funding to universities, but it also should consider the possibility of locating some federal scientists in university facilities. As indicated previously the synergism that develops under these conditions currently is outstanding.

42. *Should more ARS laboratories be co-located at land grant universities? What should be the relationship between ARS and land grant university scientists? Between ARS research coordination? How can ARS laboratory functions be more effectively linked to State Agricultural Experiment Station?*

The answer is a most emphatic yes. Examples have been given in at least two other questions. ARS scientists usually have adjunct faculty appointments and a few faculty have had some kind of USDA recognition, if not an designated appointment. ARS and SAES usually plan jointly, when they are co-located, and when there is an expectation from administrators of both ARS and the university.

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43. *Are ARS laboratory facilities effectively used in performing needed research? If not. please explain and offer suggestions for better use?*

It appears that ARS laboratories are being used effectively, but a professional society such as our does not have the needed information to make an informed judgment. We know that they have been reducing staff and increasing support through this for those that remain. This would seem to be appropriate and commendable.

Extension Service (Extension functions within CSREES):

44. *The USDA Extension Service's (ES) mission is, among other things, to disseminate research results to farmers and other customers. In your opinion, is the ES effective in carrying out this mission? (please explain).*

Extension has made many changes in its approaches over the years and continues to do so, so that it can continue to be effective. It does this for all of its clientele and not just production agriculture. Many extension specialists located on campuses or at branch stations are active in research projects regardless of whether or not they have an official research appointment. Many have split appointments and several work with graduate students. They also have the advantage of working in the field with clientele, so they are well versed in problems needing immediate solutions. Extension is most effectively using cutting edge communications technology to serve their clientele.

It appears however, that extensions' original mission has been lost with resources being directed toward areas of social concern. We understand that extension is reexamining their proper role in agriculture. We encourage this because the original customer (production agriculture) still has met needs. Funds should continue to support the agricultural mission of extension and not be diverted to social programs. Social programs need additional funding.

45. *Should the ES be involved in addressing the problems and challenges confronting urban populations?*

It seems unreasonable to deny urban residents the expertise of extension personnel, if agricultural interests are not penalized in the process. After all, the welfare of the country is a major issue. Extension specialists are some of the best at working with people problems. Also, urban areas are where the bulk of agricultural food products are consumed. Input on the use of these products to foster better human health is important to the welfare of the nation as a whole. The Land Grant universities were established to serve all the people of their states.

46. *What if any role should ES play in dealing with the social issues facing farmers and rural communities?*

Social problems curtail productivity and cause unrest. Extension personnel, especially those working at the county level, are intimately familiar with the problems in the communities where they live and work. Extension at least should be prepared to analyze these problems, offer some solutions, and seek assistance when necessary. Social issues cannot be isolated from economic and technical issues.

47. *Should the ES's mission statement be changed to focus activities on production agriculture?*

Extension's mission should be continually evaluated, but **never** should it focus only on production agriculture. However, that should be it first responsibility followed by social and economic issues that impinge on production agriculture. Processing and distribution also are of major importance, if production agriculture is to succeed.

48. *What should ES not be involved in?*

Extension should not be involved in service, especially that which can be/is provided by private groups. However, often it is necessary for extension to initiate things, soon after which commercial entities see the opportunities and move in. Extension should not duplicate what other entities are doing; conversely other entities should not duplicate extension activities.

Dissemination of research results:

49. *Do you have any suggestion on how USDA's dissemination of Federal agricultural research results can be improved?*

The results of all research, both USDA in house (ARS, FS and ES) and SAES, must be considered. It is vital to have complete linkages with extension personnel in all states, because the extension personnel are the best possible source of dissemination in forms that promote immediate adoption and utilization. The information must be made available continually in electronic form to all potential users, but especially the extension personnel. Extension should be continually updated about progress of research and not just when it is completed. There needs to be complete sharing among the performing and user entities.

50. *Who is, or will be, responsible for developing a marketing plan for agriculture and its science and education programs to the American people?*

Marketing plans for agricultural products is the responsibility of the private sector. However, the Land Grant system must make available the results of its marketing research to aid the private planners.

Marketing of educational opportunities is the responsibility of the academic programs personnel in the Land Grant universities. They can be effectively aided by the extension personnel, who have considerable frequent contact with the clientele. Branch station personnel and some researchers also have opportunities to inform high school counselors and others working with youth of opportunities in agriculture related careers. Again electronic technology offers numerous opportunities of effective ways to do this.

Current Research Information System (CRIS):

51. *ARS uses CRIS to provide information about USDA research projects. How, if at all, do you use CRIS?*

A professional society has very little use for information from the CRIS system, but it's members, especially those in the universities, make extensive use of the system. The Committee needs to be fully aware, and probably is, that the Land Grant system also provides information to the CRIS system about all of its research projects, regardless of whether or not they use federal funds. Projects supported totally by non-federal grant funds also report their finding to CRIS. The primary use by SAES is to learn what research is being conducted that relates to some being planned. Extension personnel may use the system to search for sources of information. Because the reports currently are only summaries, extension personnel request more complete reports from which to develop their educational materials.

52. *In your opinion, is CRIS effective in helping you obtain information on Federal agricultural research projects? If not, what changes are needed to this information system that would provide quality data on Federal and State agricultural research? (please explain)*

CRIS is effective for obtaining limited findings, funding and personnel information about all publicly conducted agricultural research, **but** more than that is needed now. Again with current electronic technology a comprehensive management information system is practical and is needed urgently. We recommend an extensive updating of the CRIS system, so it can serve more effectively the research community, the extension community and the private sector.

53. *Is there/should there be an appropriate and adequate management information system(s) in place to report and collate results from Federal investments in research, extension and higher education sponsored by the USDA (and related research agencies)?*

No, there is not one in place, and **Yes**, there is an urgent need as indicated in the previous response. The information also should be fully accessible via electronic technology such as the World Wide Web (WWW) and ftp (file transfer protocol) sites as a minimum.

54. Does the CRIS system and other USDA reporting systems provide an adequate accounting of the research and extension work that is being done in America?

The CRIS system provides well the information for which it was designed, **but** that is no longer adequate. CRIS was not designed for extension reporting and Extension appropriately never tried to use it. Extension has a fairly effective reporting system, but we believe they too have a need for a more comprehensive management information system. It is not likely that a single management information system can serve both research and extension effectively without becoming cumbersome. However, if two systems are developed, they should be planned together, so they can be effectively linked/referenced to each other.

International Relations:

55. How can the USDA be most effective in the short and long term through its support of international activities?

It seems certain that USAID will continue to reduce it's agricultural development activities in developing countries. These important activities need to be continued with effective planning and operation. Agricultural development is the first step, but not the only one, to assist developing countries to improve their economies, so they can purchase U.S. products. In addition, the U.S. frequently obtains valuable germplasm from these countries. There also is the humanitarian issue to consider in working with them. USDA needs to be prepared to fill the void that is being created, but **should not** divert funds from other programs to carry out development activities.

56. Currently, USAID and other programs extend agriculture and agricultural development beyond the nation's borders. What continued or expanded role should USDA play in international research, education and extension?

Suggestions in the previous response is all that we can suggest at this time.

57. What is the role of USAID in funding agricultural research and extension? Has USAID maintained support for agriculture or has the agency moved away from agriculturally related programs? What is the role of long-term agriculture R&D in developing countries in developing new markets for U.S. products? Should USAID contract through USDA/REE for long-term agriculture R&D?

The role of USAID should be to support agricultural research and extension for application in developing countries as one phase of efforts to enhance their economies and living standards. AID has been effective in doing this, and there have been spin-offs from these programs that were valuable domestically. USAID has moved away somewhat from agriculture related programs. The role of long-term agriculture R&D in developing countries in not only developing markets for U.S. products, but also improve their economies and the well-being of their citizenry. USAID should continue to contract for long-term R&D in developing countries, but it likely will be more effective through currently existing university consortia than through USDA/REE. Perhaps USDA/REE should participate in the consortia, where they have the expertise to do so. All of the CSREES research scientist capacity is located in the universities, although CSREES does have some very competent management personnel who could contribute to these programs. The bottom line, however, re contracting it appears USAID will be doing less and less agriculturally in the developing countries unless its priorities change.

SOIL SCIENCE
SOCIETY OF AMERICA
677 South Segoe Road • Madison WI • 53711 • (608) 273-8080 • FAX (608) 273-2021

29 October 1995

The Honorable Pat Roberts
United States House of Representatives
Committee on Agriculture, Chairman
Washington, DC 20515

Dear Congressman Roberts:

The Soil Science Society of America (SSSA) was honored to receive an invitation to respond to your request of 12 July 1995 to questions posed for the Research Title of the 1995 Farm Bill. We fully support your efforts to solicit input from the scientific community on legislation that will impact the future direction of agricultural research and education.

We've responded in a more general way to the individual groups of questions rather than prepare responses to the individual questions. At our annual meetings, the Executive Committee of SSSA on 28 October 1995 endorsed the submission of these responses.

If there is any way that we can further assist you, please feel free to contact us.

Sincerely,

David E. Kissel
President

Larry P. Wilding
Past President

H.H. Cheng
President Elect

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SOIL SCIENCE SOCIETY OF AMERICA*
RESPONSE TO THE AGRICULTURAL RESEARCH, EDUCATION AND EXTENSION QUESTIONS FOR DISCUSSION

SSSA Executive Committee

Introduction Statement

The Soil Science Society of America is a scientific professional organization with over 6300 members representing over 100 countries. It is dedicated to the advancement of soil science, technology development, and educational pursuits in the areas of crop production, environmental quality protection, bioremediation, waste management, and wise land use and management. Soil resources are the foundation of agricultural development and the long-term "capital" on which nations build and grow. The rise and fall of past, present, and future civilizations are premised on the quality and stewardship of land resources. Soil resources, interactively with air and water, are foundational to environmental quality, human health, and global ecosystem sustainability. Likewise, soil and land resources are pervasive to all other renewable natural resources. As such, they undergird the biosphere and are germane not only to the well-being of agriculture but to human existence. The following statements by SSSA are in response to questions posed about USDA and land grant university research priorities, funding protocol, and technology delivery systems. They are premised on the key role soil resources play in society.

Federal Agricultural Research Goals

The Federal Government has the responsibility in managing the nation's natural resources, ensuring an adequate food supply and maintaining the general health and safety of its citizenry. Sustaining a productive agriculture is essential to fulfilling this responsibility. A continuing federal commitment to assess the quality and sustainability of land resources as a foundation to food security and safety through research and education represents a high priority. (Question #1)

All research programs can benefit by input from diverse groups including those critical of current agricultural programs, governmental agencies, land grant universities, and the various industry sectors. Different agencies and groups can provide perspectives and expertise that will enhance research efforts. Research goals must be reviewed and evaluated in a coordinated way by all concerned groups. Programs of various research sectors should not compete, but complement one another. Research programs and activities must be supported with sufficiently long-term commitment to ensure completion of the research objectives. (Question #2)

The goals listed for FAIR '95 can be broadly adopted as a general model for guiding federal agricultural research, but they need to be expanded to include air, water, soil, land, and the supply of renewable natural resources they support. (Questions #3 and 4)

*Question numbers refer to the "Agricultural Research, Education, and Extension Questions for Discussion" document.

Priority Setting and Advisory Boards

Federal agricultural research does address the major areas of research needs for producers, processors, and consumers. However, it is difficult to assess whether the different areas are in balance with needs and opportunities for progress. Some federal research addresses very specific needs, while others are much more basic in nature. (Questions #5 and 6)

Areas of research that will require federal support in the future include those that deal with gaining new knowledge about our natural resource base. The fabric of life on this planet depends on sustaining a quality environment. The quality of the air, water, and soil that sustains us should not be taken for granted, and a search for a better understanding of how the soil, water, and air are linked and interact to sustain a quality environment deserves research support. Industry does benefit from a quality environment but cannot by its nature carry out research in these areas since there is no immediate and direct profit for doing so. Yet, the continued progress and profitability of our agricultural industry and the health of our citizens depends on it.

In general, research needs that cannot be carried out profitably by agricultural industry should be supported by USDA-REE. In some research areas, shared funding of research programs between federal government, state government, and private industry can allow a sharing of costs while also providing a voice to all three for providing input to the specific research projects. (Question #8)

Stakeholder advisory boards have an important role in setting the research agenda. All stakeholders can and should serve on the same advisory boards. For example, stakeholders from private industry and government regulatory agencies can serve together on a single advisory board and can gain an understanding of each others goals and needs and hopefully arrive at a consensus for research and education program direction. (Questions #13-17)

Funding Considerations

As a nation, we must carefully balance our priorities in research, education, and extension investments. Many of the challenges in natural resources, agriculture, and the environment require long-term commitments to address high priority research areas. Exploitation of temporary, short-term solutions without assuring long-term viability and renewability is a prescription for failure and disaster.

Science is the engine that drives the train of American agricultural technology and related economic, social, and environmental benefits for our nation. For this engine to work, it must be fueled with fundamental and basic science-oriented research thrusts so the technology-driven output will remain viable for the next 10 to 15 years. The exact mix of these funds will be determined, in part, by the specific research targets and will likely involve a balance between in-house, formula, and competitive or special grants. In the future a smaller fraction of the research will be internally competitive and a larger percentage will likely be externally peer-reviewed and nationally competitive. All play a pivotal role in keeping the engine running. (Questions #18 and 22)

Funding levels to the scientist cannot be reduced below some threshold level or the critical mass required for synergistic interaction among scientists will be lost. Furthermore, research is less efficient when funding levels become so small that timely allocations for personnel, supplies, equipment, travel, etc. are not available. Current research effectiveness could, perhaps, be increased by taking advantage of electronic networking, long distance learning, increasing proximity, and probable interaction of scientist with overlapping discipline specialties, financial, or other incentives to encourage interdisciplinary research, decreased administrative overhead, decreased administrative and researcher's time spent on accountability, and a longer term horizon for research considered of national or regional priority. (Question #19)

As discussed above multi-year USDA commitments to address research programs will be essential for continuity and effectiveness. Foundational research with significant basic thrusts should be supported by both formula funding and NRI sources with an increasing component coming from NRI sources in the future. The NRI program is an excellent example of a NSF model basic science research program. NSF is considered by scientists in most fields as the best federal model to emulate. This peer reviewed research is held in high esteem by scientists, program directors, and private and public sectors knowledgeable about research protocol. Possible disadvantages of NRI and other competitive grant or special grant programs is that they may lack continuity and be short-term. However, commonly the most creative ideas and productive research teams arise from competitive peer-reviewed research. With sustained funding, such research can produce the most progress and ultimate payoff to the nation. When congress has interrupted the research by changing national or regional priorities from long-term to short-term, with many start-ups and stops, serious damage to the research productivity has followed. Multi-year research funding by USDA through formula funding should be maintained, but justified by more rigorous external peer-review before accepted for Hatch funding. Funded projects should be terminated or revised on a five-year schedule. If revised, the proposals should again undergo national external peer-review. From Hatch-funded projects our knowledge base has increased exponentially and numerous peer-reviewed journal articles and other prestigious scientific/educational documents have contributed inordinately to the foundational literature on soil and land resources. This is one measure of scientific productivity and verification of federal expenditure accountability. (Questions #20, 21, 38, 39, and 40)

Unfortunately, use of public funds for research, service, or other societal goals is not viewed positively by many of our citizenry. This perception has augmented the need for greater accountability in federally-sponsored USDA and land grant university programs. NSF surveys show that less than 5% of the public is scientifically literate. Only through better public relations, better communication with the public on the societal value of research programs, and a reinstitution of public trust and confidence in the value of science and research is this whole accountability dilemma going to be reversed. More stringent accountability policies, regulations, and red tape will only add to decreased research efficiency. (Questions #19 and 21)

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Greater acceptability among the research community and professional societies for "special programs" in research, education, and extension will be needed to avoid the perception (or reality) of pork barreling, special interest agenda, and non-peer reviewed status. The programs need to stand "on their own merits" under constructively critical peer reviews by the scientific community. (Question #23)

A number of federal and land grant university facilities are becoming dated. They are not state-of-the-art facilities and options for replacing or upgrading major equipment are limited primarily to grant-funding sources. Grant funds in the soil resources arena have been competitive and thus facilities for these programs have suffered more than more glamorous research fields such as biotechnology. It is proposed that allocation of facilities funding would be on a competitive basis. In some instances regionalization of such allocation may be justified (e.g., for field and laboratory instrumentation to quantify water quality parameters, to do soil process, dynamics and modeling of soil system functionality and behavior). Here there may be an opportunity to partner with private and public sectors to jointly sponsor research of mutual benefits and interests. For example, environmental groups may be willing to join with public entities, land owners, foundations, and corporate interests in research quantifying wetland processes and delineations. Another example may be commodity "check-off" programs that would support basic and applied research, institution building (facilities), and educational programs directly germane to their interests. (Questions #24-26)

Delivering Agricultural Research

The most significant actions that USDA could take are

- improve the technical competency of its agricultural advisors who are providing service to farmers. County agents cannot be experts in all areas of agricultural production. In some cases they may serve as a local expert for a few commodities in several adjacent counties. Advanced degrees such as an MS in their area of specialty should be encouraged or required. Distance learning opportunities should be taken advantage of for improving the competency of county agricultural agents.
- electronically link state extension specialists with regional and county agents so specialists can more easily provide advice for problem solving.
- encourage joint education programs with industry.
- encourage more research/demonstration efforts at the local level. With more technically competent county and area agents and collaboration with farmers and the agricultural industry, good programs can be made better. (Questions #27-29)

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The extension service can provide useful information and education to urban communities and serve as a source of unbiased information. Such areas include pest control, waste management, efficient water use in urban areas, and the management of landscapes and landscape plants, but should not extend beyond these traditional areas of activity. The model of an effective extension service in rural areas can be applied in urban settings as well. Urban problems can often be difficult but the extension service can have a very positive impact, not only through its programs of technical advice, but also through its 4-H youth programs. However, the extension service should not provide the services done routinely by retail nurseries or private consultants. (Question #45)

Finally, a more extensive marketing plan should be provided for both agricultural research and extension programs. A national agricultural communications office could develop articles that would be targeted to national news media — radio, TV, major news magazines, and major newspapers such as the *New York Times* and *Wall Street Journal*. (Questions #49 and 50)

International Relations

The international arena is an important sector to the SSSA (20% of its membership). Neither the long-term sustainability issues we face nor the research needed to resolve them recognize national borders. Globalization of soil and land resource issues as they may affect agriculture, the environment, and society as a whole is markedly increasing and critical to the sustainability of the biosphere. The USDA has expertise in the soil and land resources that is directly germane to these international activities. This is particularly true for land resource evaluations to identify soil constraints, determine crop production potentials, develop land carrying capacities, and assess agricultural development potential of least developed countries (LDC). However, in this regard, it is critical that USDA personnel engaged in such endeavors maintain an functional working relationship with key land grant universities. Only through such synergistic relationships can the "whole be greater than the parts." (Questions #55 and 56)

Agricultural R & D funding has been cut drastically during the past few years. This is a very short-sighted approach by USAID. One of the few USAID programs to maintain continuity and credibility for USAID has been the CRSPs which are joint efforts with the USAID, land grant universities, USDA, and National Agricultural Research and Extension Institutes of LDCs. Economic development in LDCs must start from the agricultural sector. Asia and Brazil are good examples. Otherwise, LDCs will never be self-sufficient and be able to purchase US products. Hence, to address the technical, political, and socioeconomic issues of LDCs requires a team partnershiping. Professional societies such as the SSSA can help blend this mix of expertise and add credibility to the team assembled. At the present time benevolent foundations and USAID CRSPs have been most successful in developing a framework to undertake such international development activities. The USDA has a definite role but not a singular one. (Question 57)

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AMERICAN SOCIETY OF AGRONOMY
CROP SCIENCE SOCIETY OF AMERICA
SOIL SCIENCE SOCIETY OF AMERICA
677 South Segoe Road • Madison WI • 53711 • (608) 273-8080 • FAX (608) 273-2021

29 October 1995

The Honorable Pat Roberts
United States House of Representatives
Committee on Agriculture Chairman
Washington, DC 20515

Dear Congressman Roberts:

The American Society of Agronomy (ASA), the Crop Science Society of America (CSSA), and the Soil Science Society of America (SSSA) were honored to receive an invitation to respond to your request of 12 July 1995 to questions posed for the Research Title of the 1995 Farm Bill. We fully support your efforts to solicit input from the scientific community on legislation that will impact the future direction of agricultural research and education.

At our annual meetings, the Executive Committees of ASA/CSSA/SSSA on 29 October 1995 endorsed the submission of these responses with the following qualifications:

1. The responses are best described as opinions offered by one or more members and do not necessarily reflect the opinions of the entire membership.
2. The number of responses generated per question should not be construed as the importance attached to the questions.
3. From the responses received, we have attempted to identify both the consensus, as well as the divergence of opinions to the questions, where appropriate. We would emphasize that these opinions are a very limited subset of the members of the Societies.

However, we hope that these inputs, along with the many others you are likely to receive, will be of benefit to you and your staff as you proceed to identify the priorities that will benefit agriculture and the public.

If there is any way that we can further assist you, please feel free to contact us.

Sincerely,

Robert F Barnes

Robert F Barnes
Executive Vice President

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HOUSE AGRICULTURAL COMMITTEE'S QUESTIONNAIRE

Responses from the

American Society of Agronomy
Crop Science Society of America
Soil Science Society of America

Federal Agriculture Research Goals

1. What should be the role of the Federal Government in agricultural research?

All respondents expressed the importance of federal funding for agricultural research. Funding of research should be at a level comparable to the importance of agriculture to the nation's economy and security. In today's global economy, agriculture is the major source of reducing the balance of trade.

Divergence of opinions emerged when the specific role of the federal government in ag research was addressed. The single largest group of respondents (43%) stated that the feds should be involved in **both basic and applied research**. Federal agricultural should focus on areas of national importance to agriculture that will not be taken on by state institutions or by private industry because of the cost and/or of the risk involved e.g. a) plant and animal germplasm acquisition, enhancement, and preservation, and b) mapping of plant and animal genomes. Some of the federal effort should be on research considered as high risk. "Pay offs" may not be immediate but this type of research is necessary for the major break-throughs that are so important to maintain a strong competitive advantage in the global arena. It is also vital that the federal government maintain a strong and responsive research infrastructure that can respond quickly to crises such as the Mediterranean fruit fly infestation.

Another group of respondents (27%) believe that federal agricultural research should emphasize **basic research** but which have broad application; site-specific applications should be dealt with at the state or local level. Such basic research should a) be responsive to yielding leadership over when applicable findings are made, b) be sensitive to industrial research trends, c) aware of marketability of ideas, and d) be very sensitive to international research trends from competing nations.

A final response indicated that the federal government should not be a direct user of funds but **primarily a granting agency**. As such, there would have to be a) a national food policy developed with clearly stated objectives, b) the development of a workable system for assessing and prioritizing research needs to carry out such a policy, and c) a rational plan for phasing out federal research programs and facilities.

2. To what extent should goal setting and goals in agricultural research be cognizant of and coordinated with research activities in the rest of the Federal research sector (HHS, EPA, DOE, etc.)?

Responses were overwhelming in support of coordination among federal agencies in setting goals. Qualifying statements included:

- The key to goal setting and support for not only agricultural research but all federal activities should take a **"bottom up" approach**. This approach requires input identifying the needs/issues from all sectors of agriculture and, then, a consensus process at each level within government and agencies and ultimately in the context of national goals. A bottom up approach will assure that our agricultural research and other programs are on target and will also enhance citizen support for agricultural REE.
- **National goals must be flexible** to be responsive to the needs of specific areas.
- Coordination among agencies is **most relevant in the environmental and health related areas** where regulatory and research activities are often not consistent on goals and objectives. There is a need for **continuing oversight** for all federally funded agricultural research which should be reported to the executive branch and the legislature in order to reveal gaps and/or unneeded duplications.
- In addition to coordination, **active cooperation and joint projects** are also needed. A national food policy and funding via grants and contracts would have a powerful and beneficial effect on such cooperation.

3. Is the process associated with the Food Animal Integrated Research for 1995 (FAIR 95) adequate for the development of Federal agriculture research goals? Are there goal identification process which might better serve to enhance Federal agricultural research other that FAIR "95"?

If familiar with FAIR 95, the respondents agreed that **the program was on the right track**. Including generators, transferrers, and users of technology in the process is an excellent way to generate the priorities in research and its application. It would be helpful, however, to **involve others in the research community** - chemists, physicists, educators, social scientists, environmentalists, and the private sector - to help fold agricultural research into the total effort. Without such inclusion, the process can be perceived as too narrow and self-serving.

4. If the process of FAIR "95" were to be used to adopt an agenda for Federal agricultural research, how would the goals identified in FAIR "95" and listed below, need to be modified to address the concerns of all research stakeholders?

1) Enhance industrywide responsiveness to consumer and social concerns;
2) Meet market demands through increased efficiency and competitiveness;
3) Develop integrated food animal management systems;
4) Maintain and enhance environmental quality;
5) Improve food quality control in terms of safety, desireability, and nutritional compositions, and
6) Enhance animal well-being throughout the life cycle of food producing animals.

- It is important that these goals be established in the context of a larger group of stakeholders, not only those directly connected to USDA programs and activities but also those representing environmental and natural resource concerns as well as state agency leaders, industry, consultants, international trade, and the public.
- There is a need for greater emphasis on interdisciplinary research that studies the integration of system components into an ecosystem and a socio-economic framework. 'Management' in Issue #3 needs to be expanded to include production, processing, and utilization systems.
- Research is needed to enhance the rural economy and quality of life through development of new markets, new value-added products, sustainable agriculture, and greater efficiency of resource inputs.
- Additional goals should be developed in the areas of emphasizing the human component as well as social issues.
- More emphasis is needed in integrated management systems as a key for competitiveness of our production systems as well as for maintenance of our present advantage in food and fiber costs in this country.
- Alternate uses of agricultural products is an area that needs to be addressed to maximize the impact if agriculture on our society.
- Item #4 should be expanded to include sustainable production rather than environment alone. Item #5 should emphasize quality and not control.

Priority Setting

5. Is Federally funded agricultural research focused on the issues of highest priority for producers, processors, and consumers? If not, how can the priority setting mechanism be improved to insure that these issues are addressed?

The general consensus is that federally funded agricultural research is focused on issues of producers, processors, and consumers but the focus may not always be on highest priority for all three groups. **Priority setting may be improved** by: a) **a continuing public review** through a body of appointees from each of these groups which would have advisory, not administrative, authority, b) **local input** is critical, and c) national goals must be sufficiently **flexible** to meet local needs.

Other input follows:

- It is extremely important that federally funded research maintain a **balance** of both mission-oriented and basic research. Without the continued input into the scientific knowledge base through basic research efforts, new break-throughs in technology will not be possible.
- Federally funded research needs to be focused in areas of public interest and geared towards intellectual leadership and national well-being in areas that are broadly applicable but unlikely to be consistent with the general short-term interests of producers, processors, and consumers. Priority setting, especially establishing the needs for basic, long-term research, requires **visionary input** that considers current and future thrusts of the private sector and the national needs.

- Basic research funded at the federal level needs to be **broad-based** and focused on fundamental principles of **national interest** that have potential for application by states, regions, or local areas. Thus, the priority setting needs to be conducted by persons knowledgeable about current and future needs.

6. Should Federally funded agricultural research address specific technological and industrial needs? If yes, does the present system fulfill this goal ? If not, please describe how this can best be accomplished?

a) The **majority** of responses were **favorable** towards federally funded research targeted at technological and industrial needs. Qualifying statements are as follows:

- **Partnering** through **matching funds** with industry should be increased.
- A **balance** needs to be achieved between **short-term**, focused research and **long-term research** that is less focused but still applicable. There should be little to no effort towards basic research that does not possess potential for agricultural application within the next 10-20 years.
- Industry should be in **communication** with the federal research establishment in order to insure **technology transfer** and allow **industry to assume major research leadership** early. Over time, federal research will gradually shift to more fundamental areas as developing applications are transferred to industry.

- Certain areas which have **no profit motivation** such as water quality, soil erosion, value of diversity, and biocontrol methods will need continued support from the federal government and the experiment station network.

b) One respondent replied that federally funded research **should not** address such topics but rather industry and, to a lesser extent, university researchers should deal with these problems.

7. Does Federal agricultural research adequately address projects that result in quantum leaps in benefits, or does it dwell too much on incremental benefits?

Respondents were unanimous in saying that federal agricultural research concentrates on **incremental benefits**. Additional comments included:

- Federal ag research is too often **too short range** in goals and, therefore, has **no chance** to make quantum advances. If federal research in agriculture is to be long range, concerned parties must learn how to judge its worth by something other than new products on the market place.
- **By its nature**, agricultural research has generally given **gradual and continual improvements** on products and practices. The exceptions have been the development of hybridization of crops particularly maize and the rapid expansion of fertilizer use following World War II. Even during this time, increases in crop yields were gradual.
- **Incremental benefits should be the emphasis** of the federal agricultural system. The incremental approach has been successful historically and will continue the advancement

of knowledge in the future. Quantum leaps arise from novel ideas and the novel idea is discarded too frequently in the present competitive grant system.

- Research results as well as quantum leap benefits are **unpredictable**.

8. What is the appropriate role for USDA/REE in insuring competitiveness in the face of decreases in price support programs?

- **Efficiency, management, and continued application of technology** will be the keys to profitability in the present environment of reduced price support. Development of knowledge and its application will be the answer to competitiveness for tomorrow's agriculture. Dissemination and application of this knowledge via extension and education are critical for any impact to occur.
- **Research and education programs must be directed** so they are conducted in an integrated manner with specific products and outcomes established. Realistically, specific outcomes will not be accomplished by competitive grants alone. **Specific funding** needs to be placed where there has or is a demonstrated ability to deliver the desired products. Increased funding focused on improving quality and targeting specific end-uses for U.S. agricultural products will result in greater world wide demand for U.S. commodities.

9. How can the appropriate Federal-State-Industry resource pools be integrated to develop high priority regional programs in research, teaching and extension?

This type of integration is already being accomplished although it needs to be further encouraged. **Effective leadership** and **salesmanship** by officials and scientists in the public areas is needed to convince the private sector to get involved in cooperative efforts that will benefit both public and private interests. An excellent example of such an integrated program is the Germplasm Evaluation in Maize project, the goal of which is to identify exotic sources of maize germplasm to be integrated into U.S. breeding programs both public and private.

- There needs to be increased emphasis on **partnering with industry**. Competitive, peer-reviewed projects jointly funded by federal-state-industry resources should be encouraged.
- There must be a **balance of funding sources** so that priorities are established by needs rather than funding source.

10. How important is the Federal agricultural research role in supporting other agencies of USDA? Of other Federal agencies? Could this be done more efficiently and at a lower cost?

All respondents agreed that federal agricultural research plays a beneficial and important role in supporting other agencies including Extension, NRCS, NSF, DOE, NIH, DOD, EPA, and ERS.

Efficiency can be improved by:

- **pooling funds** across agency lines and creating multi-agency efforts directed at specific issues or problems. The current Management Systems Evaluation Area projects are a good example of such cooperation in research and education.

- **locating ARS centers at land grant institutions** improves the quality of interdisciplinary research.
- focusing the **USDA funded research** into areas that are slightly **more applied** than NSF and NIH, and in areas less likely to be supported or developed directly by industry.

11. USDA reorganization created the Cooperative State Research, Extension and Education Service (CSREES). In your opinion, how should this newly configured agency function to support the U.S. agricultural enterprise, 1995-2002?

The reorganization of USDA offers **an excellent opportunity to establish close coordination and integration of research, extension and education.** The primary function should be to enhance communication and cooperation between research, extension and education. Joint projects will enhance the linkages particularly between research and extension and research and education. Extension programs need the scientific credibility of research-based information; whereas, research needs extension to bring its programs to focus on real world issues. Joint funding programs dealing with undergraduate research are not only enhancing the research but also the educational opportunities of undergraduates. The reorganization is a positive step to integrating the major roles of research, extension and education.

Qualifying statements:

- Increased funding for research is critical.
- There needs to be less money spent on Washington, D.C. bureaucracy and a significant increase in funding out to the states.

12. What is the proper place for integrated systems programs? What role should the Extension Service (extension functions within CSREES) play in these programs?

Integrated systems are effective ways to bring multiple disciplines and agencies together to work on specific problems. Integrated systems programs need to be expanded and become a major thrust in research programs not only fusing research and extension but also various research disciplines. Extension should be the education arm to deliver the products in consultation with clientele. To do this effectively, **the Extension Service must be involved** from Day 1 **in the planning and conduct of any research program** where they are viewed as one of the mechanisms for delivery.

Agricultural researchers and educators must convey the relevance and importance of their contributions to the urban population if they are to survive. Some suggestions for new directions to achieve this goal are:

- Design and publish educational programs on the value and role in society of soil-water- crop-landscape interactions. These programs should be useful for elementary, junior high and high school curricula.
- Develop new applied journals and magazines for state agency and consultant group readership on technology from agricultural disciplines useful for natural resource conservation.

watershed planning, soil remediation, etc.

- Regular publication of educational materials on the value of agricultural research to society in the popular media. The topics of each publication should be highly focused and carefully researched.

- Regular communication with public groups in forums designed to develop and prioritize future activities and research or education directions.

Advisory Boards

13. Have USDA's research and extension advisory and coordinating boards been effective in planning and prioritizing agricultural research and extension? (please explain).

The national advisory and coordinating boards play a critical role in **synthesizing the information from the various levels into general areas**; however, it is important that they remain sufficiently flexible to fit the specifics at the local level. **More input from local advisory/coordinating boards** into the national goals, objectives and priorities is needed. Local advisory boards are more effective in planning and prioritizing issues because they are better able to address specific problems, while national boards should work to identify the common denominator across the system. It is important to realize that advisory boards are just that, "advisory", but they offer the opportunity to receive input from a broad perspective.

14. How have research or extension priorities been changed as a result of the recommendations of advisory boards (please provide examples)? Are there presently too many advisory boards?

Advisory boards have been instrumental in **highlighting environmental concerns** including water quality, soil quality and the present emphasis on systems level research/extension activities. In one example, a local advisory board played a vital role in developing **no-till** emphasis which resulted in a research/extension station being dedicated to no-till. **Precision agriculture** is another area where advisory boards have enhanced new technology not only at the university level, but have **fostered partnerships** among universities, the federal government, and industry to investigate the impact of precision agriculture. Local advisory boards activities have been expanded to increase input, as well as **ensuring an educated clientele on the activities of research and extension** (an important function of advisory boards that is often overlooked).

15. What options should congress consider to improve USDA's process for planning and prioritizing agricultural research? (i.e. how should the research agenda be prioritized?)

There was no clear consensus to this question. The following are examples of the various types of responses:

- **The USDA should be given the freedom to focus on national problems.** Too often, specific research priorities are set from the results of special research grants which usually focuses on items of limited scope. Many of these projects could be funded by the applicable state or private industry. Supporting projects of limited national importance has led to the dilution of USDA's ability to support programs of national importance that are necessary to assure the U.S. competitive advantage in the global research arena as well as the global agricultural production arena. Because of reorganization into regions and areas, and because of increased Congressional influence, the ability of the USDA-ARS to maintain the strong national focus and the global competitive edge has greatly eroded.

- **The research/extension planning/prioritization should be a bottom (local) up process, i.e. local to state to regional to national.** The national level should concentrate on the common issues/themes from the local input. It is important to remember that advisory boards are to provide input on setting the agenda at all levels and input from these boards is critical. **A bottom up process where administration works with research and extension and advisory boards to identify common areas and establish priorities will be the most effective way to ensure that specific needs are met.**
- **Prioritizing research within USDA-ARS should be done in concert with research planning by land grant universities.** The projects chosen should emphasize more **fundamental, long-term projects** done in collaboration with the land grant universities. Some excellent examples of such fundamental USDA-ARS efforts include development of crop models and comprehensive watershed scale models of erosion.

16. What role should stakeholder advisory boards play in setting the agenda? What groupings should be represented on advisory boards? Can "customers" and "partners" be accommodated on one board or will it require two?

One advisory board should corporately develop a list of topics that need to be investigated in the national interest. The board should be composed of **all stakeholders** including academia (both public and private), farmers and agribusiness interests, as well as representatives from USDA and State Departments of Agriculture. Groupings could be oriented towards topics such as systems research, integrated pest management, natural resources, food safety and other areas. It is important to have only **one board** to facilitate the type of interaction necessary to have a functional board.

Qualifying statements:

- For success to be achieved, **full funding** to support these research areas should be forthcoming from Congress.
- The board should be set up in a way that is **free of political pressures** so that it can develop an agenda that truly meets the needs of the nation.

17. Is there a special role for advisory boards to play international agriculture beyond what has occurred in the past?

International agriculture is a critical issue in today's global economy. NAFTA and GATT are examples of the global nature of agriculture. An advisory board is needed now more than ever. **The board must be visionary, in tune with international needs, above political agendas, and cognizant of the need for long-term commitment.** The board would give direction to international agricultural efforts and legitimize research by gaining approval of outsiders and users. We have an **essential role** in the international research and extension activities as well as educational aspects and a specialized international agriculture board is needed.

Qualifying statements:

- Agriculture must address **present and future global human needs** for food, fiber, fuel and construction materials, not continue the age-old agenda of only food and fiber.
- Because agriculture subsidies will be reduced or eliminated, the U.S. must understand its comparative commodities production advantage in the **global context**, not in isolation.
- Congress needs to understand the impact that global **population growth** will have on how we should be planning to manage our finite soil, water and biological resources.
- Congress needs to understand and support the important role for agriculture in **"Agenda 21"** that came out of the 1992 Rio conference. The U.S. is lagging far behind the global village in understanding and addressing the significance of the "Agenda 21" issues.

Funding Considerations

18. What is the most appropriate mix of Federally funded basic and applied agricultural research?

There was no clear consensus on this question. Responses included:

- When discussing applied and basic research, one must always remember that research is **an evolutionary process**. What was basic research yesterday may be applied research tomorrow. If one defines basic research as emphasis on "why" issues, including the interactions of components within systems, and applied as application of knowledge to develop solutions to specific needs, then, a 50/50 balance between applied and basic would probably be correct. However, this is extremely dependent on the knowledge base of a given discipline or possible solutions to specific problems. When the knowledge base is low, more priority should be placed on basic research, when the knowledge base is well known, then the ration should be more applied. The critical issue is not debating the ratio of basic and applied, but instead it is the **balance between component oriented and system oriented research**. We need to increase the level of activity and funding at the system level.
- Both applied and basic play a vital role in driving American agricultural technology. The exact mix of funds should be determined in part by the **specific research targets**, but will likely involve a balance between in-house, formula and competitive or special grants.
- Both are critically important but the government is in the best position to be the major funding source of **basic research.** Jointly funded partnerships with industry must be developed to ensure the most efficient pursuit of applied research.
- **60% applied, 40% basic**.

19. How, if at all, can the effectiveness and efficiency of agricultural research be enhanced at current funding levels? At reduced funding levels?

Current research effectiveness could possibly be increased by taking advantage of **electronic networking, long distance learning, increasing proximity and interaction of scientists** with overlapping discipline specialties, financial and other incentives to encourage **interdisciplinary and systems research**, decreased administrative overhead, and increasing focus on **longer-term horizons** for research considered of **national or regional priority.**
Additional suggestions:

- "Pork" funding and remote, narrow-focus ARS labs should be eliminated.
- Decrease administrative and researchers' time spent on accountability.

Qualifying statements:

- Funding levels for agricultural research cannot be reduced below some **threshold** level or the critical mass required for synergistic interaction among scientists will be lost.
- Research is less efficient when funding levels become so small that scientists are spending more time writing grant proposals than doing research.
- Reduced funding will only increase the competition among individual researchers and reduce the progress toward developing research teams.
- If funding is reduced, it is critical that more of these funds be targeted toward systems level research to minimize competition among individual researchers.

20. How can future funding be determined and justified so as to permit multi-year programs to be completed?

Agricultural research is complex by nature, integrating the chemical, physical, biological and mathematical sciences in a manner that addresses important problems in the soil, plant, animal and environment continuum. In many cases, research projects require multiple years to complete and results have limited value unless continued to the final step. Multi-year funding such as **formula funds** provided by the **Hatch Act** is **peer reviewed** and **facilitates researcher expertise, development of research methods** and is **effective in problem solving**. Short term grants tend to force researchers to frequently change directions, to work in areas outside their expertise, and attempt to use unfamiliar or incompletely developed methods.
Suggestions for determination of funds:

- **Formula funds** play a crucial role in providing for multi-year research efforts and increasing formula funds would lead to enhanced multi-year projects.
- Another way to fund multi-year projects would be to **free up the time limits of other granting mechanisms.**
- Commitments for long-term funding must be made by the government, foundations, and commodity groups with provisions for **matching funds**.

Examples justifying multi-year programs:

- Testing a single application of gypsum as an ameliorant for subsoil acidity over two years would show that its effect was only marginally of benefit, whereas over a thirteen-year period the single initial application proved to be highly economic in terms of improved crop production.

- Plant breeding, where each sequential step requires time for plant growth and harvest taking multiple years to complete breeding results.
- Monitoring long term trends in environmental factors such as changes in pollutant level or their abatement.
- Development of GPS/GIS technology.

- Studies of plants that have aperennial (multiyear) life duration, such as forage grasses, legumes, and trees.

21. In view of the growing emphasis on greater accountability of Federal expenditures, do you have any suggestions as to how agricultural research results can be measured and their impact evaluated? Is there some standard of accountability for the efficient and effective use of Federal research funds?

There were two major themes from the responses:

- **Accountability** is essential and a workable system of accountability should be developed. The system should determine the progress towards completion of the objectives with the next step being determining the impact of these objectives on agriculture. Two general areas would be addressed: 1) development of scientific knowledge and information in the specific area being investigated, and 2) direct impact on agriculture as a whole. One suggestion included the formation of an outside evaluation team to assess research.
- The **results of agricultural research** are well documented and **prove the worthiness of Federal funding**. The number of new products, new crop varieties, new technologies, and other advances provide adequate evidence that the Federal funds provided for agricultural research have been well spent. If the USDA research arm is given the freedom to maintain a research environment that will continue to attract high quality scientists, accountability will not be a problem. More stringent accountability policies, regulations and red tape will only add to decreased research efficiency.

Qualifying statements:

- It is extremely important for the Federal government to **fund some high risk research** that will allow researchers to continue to make **major break-throughs** and maintain a **global competitive advantage**.
- A research environment that is characterized by changing research priorities over which the bench scientist has little control, will not attract the best scientists and is doomed for mediocrity.
- In order for our science to be successful, **interdisciplinary research** should be highly encouraged and well funded.

22. What is the proper balance between in-house, formula funds, competitive grants, and special grants?

The proper balance between the different funding mechanisms is difficult to define. Existence of multiple types of funding sources and administrative mechanisms serves to provide appropriate means by which **diverse goals** can be achieved. Each type of funding has **particular strengths** and thus the **proper balance depends on the type of research project and the life cycle of individual projects being researched.** It is crucial to maintain resources for **long-term research projects.**

Suggested functions and characteristics of the various funding mechanisms:

Formula Funds:

- Should be keyed in part to **the value of agricultural production** and must be increased to continue the necessary agricultural research infrastructure. These funds should include provisions for retraining every decade of AES scientists.
- Special garnets and regional projects supported by formula funds address the need to create teams **spanning several disciplines**.
- Should be used as **"seed money"** with which to explore new, sometimes high-risk ideas that could lead to competitive grant proposals.
- Tend to lose their identity, are nearly impossible to target, and accountability is questionable.

Competitive Grants:

- Should be used to address **longer term research** on national and international importance. Funds should be sufficient so as to permit funding of one-third of the proposal received for 3-5 year projects.
- Offer **accountability** but tend to generate **cyclical research programs**, which is good for training graduate students and offer experience to post doctoral scientists.
- May be less able to provide a structure for multi-disciplinary research, unless specifically constructed for this purpose.

Special grants:

- In rare cases could be used to address **high priority issues** emerging in response to public demand.
- Offer good **accountability**, usually require a **multidisciplinary** team and take longer to get results.

Should be **seed money** to get started with federal administrators of these grants playing a pro-active role in assisting the researchers in finding continuing funds.

- Often go to projects that the scientific community views as being of **lower priority.**

In-house Monies:

- Should be used to address problems important to the **state or region**.
- Unfortunately, these fall under the **campus administration** made up of satiated persons who deem that agricultural research is out of date.
- Should help maintain the **long-term focus** of projects.

Possible percentage allocations:

- Federal Formula- 30%, Competitive Grants- 25%, Special Grants- 10%, In-house Monies- 35%
- 50% through ARS (25% should go to long-term projects, 20% set aside for short term solutions for special problems), 50% through CSREES; within CSREES Formula- 45%, Competitive Grants- 35%, Special Grants 20%;

23. What guidelines should be used in determining appropriations for "specified

programs" in research education, and extension?

List of suggested guidelines:
Major:

- **Have high priority status (urgency) at the local, regional and national levels enhancing the infrastructure of the system.**
- **Include a precise statement of desired outcomes and mechanisms for assessment and accountability.**
- **Encourage interdisciplinary and interagency programs**

Minor:

- Possess ability to **leverage** other public/private sources of funds.
- Include **specificity** (sharpness of focus) of problem/program
- Contain **applied research and technology transfer components**.
- Include and accept **local and regional indicators** of impact and accountability.

24. Should Federal funds be used for programs only, or for facilities as well? if for facilities, how should they be allotted - competitive proposals or other? Is there a place for regionalizing research, increasing competitive grants, etc.?

There was a clear consensus that Federal funds should be used for **both programs and facilities** and funded through a **competitive mechanism.** Facility support plays an important role in focusing educational, research and extension efforts on critical problems within a region and encourages interdisciplinary team efforts and interagency cooperation. Several respondents specified that facilities should be funded **competitively within regions.** Regionalization of research is important and competitive grants should be increased to facilitate regional research efforts.

Qualifying statements:

- Majority of Federal funds should be for programs, with a smaller portion going to facilities.
- Federal funds should require a **50% Federal and non-federal match** to ensure partnerships.
- Regionalization is advisable, but without eliminating efforts in support of smaller industries.
- Care must be given to recognize areas of the country that are facing **unique agricultural problems** that are not well captured by existing administration regions (example-Great Plains).

25. Is there a place for partnerships not only with state and local public sector organizations and industry; but also with private foundations?

Yes, there is a place for partnerships. There are numerous partnerships today between private industry, private foundations, state, local and national entities and these **partnerships need to be increased.** Land grant universities must protect and maintain an unbiased label as they enter these partnerships and distribute the information and research results.

26. To what extent do self-assessed "check-off" fees on commodities provide resources for research and education? Do these/should these programs support long-term research, as opposed to short-term produce development and promotion research?

There was a consensus that **commodity support is a significant source of funding** and is useful in solving practical problems facing agricultural producers.

The **majority** of respondents expressed this funding generally goes to **short term projects** and are **more applicable on a state level** than on a national level. A **minority** opinion was given that commodity support has done an excellent job of **funding both long and short term** research activities.

Federal/state research funds should go to support long-term research and commodity "check-off" funds should be used for short-term research.

Delivering agricultural research

27. In order of priority, what would be the most significant actions USDA could take to improve it's management and/or delivery of agricultural research?

There were two different approaches to this question:

- The USDA must have a plan that focuses on programs of **national significance** and programs that will not be done by states or private industry. This plan should maintain a **balance between basic and mission-oriented research programs**. The plan should maintain a **balance between short-term and long-term research** programs and ensure that the long-term programs are securely funded for the expected length of the projects.
- The USDA must finalize the merger between CSRS and CES by facilitating the **bidirectional flow** of information, data and ideas **between research and extension.** This is being done successfully at the local level, but **must be enhanced at the regional and national levels.**

28. What options should Congress consider to improve the delivery, results and benefits of Federally funded agricultural research?

Delivery and quality of research results is ensured best by a **peer review** system of research that is conducted by researchers and aided by practitioners. Peer review allows the best ideas and best scientists to be funded. **Competitive grants** funding needs to be increased to enhance the effectiveness of agricultural research. **Linkages** between **research and extension** need to be enhanced.

Qualifying statements:

- It is important that Congress realize that the "one size fits all" model of delivering information is not effective. It is dependent on the specific problem and the results to be delivered.

- The present system has been extremely successful and will continue to be successful as long as we do not continue to request and expand its role without expanding funding.
- Focusing research improves the potential for direct benefits from research, but cannot guarantee the application. No system can predict a cost-benefit analysis of research in advance and it may take several years before the total impact of research can be measured.
- Goals needs to be set on conducting quality research in areas deemed to be important for needed additional research.

29. What should be the Federal role in insuring training of future work forces for the food and fiber needs as well as the natural resource concerns of the public?

The federal role is highlighted through the partnership of research, teaching, and extension within **the land grant university**. The continued support of this system is the primary role at the federal level, however, we also need to develop the distribution of this information into **the K-12 system** which is being addressed only to a limited extent.

Federal review of university programs in education and training may reveal potential shortages or oversupplies. **Grants to support graduate programs** in needed areas could help to alleviate the problems.

Land Grant Universities

30. What is the continuing role of Land Grant Universities? 1890's Colleges? 1994 Colleges?

All three institutions have similar continuing roles targeted at somewhat different audiences. The major strength of the system has been and will continue to be the combining of **research, teaching, and extension**. The flow of information from the three different roles is critical and should continue to be a major role within all three. The systems role should continue to be focused on serving the general public.

- One problem is the current trend toward state-assisted land grant universities rather than state supported. Continued reductions in funding for research and teaching programs will cripple the nation's ability to remain competitive in the world marketplace.
- An important consideration is giving minimal requirement for entry into the system i.e. GPA for entry.

31. Is the current formula used for allocating Federal funds to land grant universities fair, reasonable, and does it address changing conditions? If not, how could it be improved?

Any formula could be changed to increase fairness, however, from a historical perspective it appears that **the formula has been very effective**. The major problem is that **funding is inadequate**. An equally critical question is the distribution and fairness of competitive grant funding. At times, it appears that the competitive grant system has not been open to the innovative idea or investigator and has been discriminatory against new investigators while enhancing funding for established investigators.

32. The land grant universities have system of agricultural experiment stations in each state. In today's environment of federal and State fiscal constraints, is an extensive system of research stations still warranted (please explain)? Could certain functions be merged with other USDA agencies, other Federal agencies, etc.?

The majority of respondents expressed the view that the research station system could be reduced but there was division on how such a downsizing should occur. One view is that land grant experiment station location and goals need to be reviewed from a national not a state point perspective. More, however, felt downsizing would have to be done on **a state-to-state basis**:

- Not all states have the same system of branch experiment stations. For some states, branch stations are major research centers (e.g. Minnesota) with a complement of research scientists and labs as well as field research facilities, or even Research and Extension Centers (e.g. Washington) with both research and extension faculty members. While in other states, the branch stations are field research facilities operated by a Farm Manager (e.g. Nebraska) but without resident research scientists.
- There are many aspects of agriculture research which are of general applicability; these can be dealt with in centralized locations. As resources shrink, most states have already bee adjusting their research programs to address only priority issues. Opportunities for further collaboration between state and federal agencies should always be explored.

On the other hand, the opinion that **experiment stations are required in each state** was also expressed. The diversity of the experiment station is one of the major strengths of the system. A station in each state is needed **to address the local problems** within the state and as a means **to gather information** and input for priority setting. A major advance in ag research today is the application of the concept of **precision agriculture**. Branch stations that are strategically located will be able to provide critical information essential for the success of precision agriculture practices. Removing the experiment station would greatly reduce the **linkage and interaction with extension and teaching** and be detrimental to the system.

33. How can agriculture research be best coordinated among Federal, State and private institutions?

Although there is presently much favorable interaction among federal, state, and private institutions, it would seem that some national agricultural research organization could be formed that consists of the some of the most innovative from USDA, state experiment stations, and industry similar to the group that has focused on the National Germplasm System. Perhaps, such an organization could operate under the auspices of the National Science and Technology Council. To best serve agricultural producers and consumers, however, such an organization must be completely removed from all political influences.

- Coordination could also be enhanced through joint funding and housing.
- Competitive peer-reviewed research needs to be the priority.

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34. What models currently exist, and are in use to provide regional cooperation in research and extension?

Regional research projects do an excellent job of providing regional coordination but they need to be somewhat redirected to increase multidisciplined or system oriented research. this is presently being done and discussed in a number of regions. Commodity organizations have expanded the coordination of regional research. Some federal granting programs have also taken a regional approach. Regionalization or at least state involvement of bordering states is very common among AES and CES directors developing cooperative programs to address common needs. Regional and national professional societies have greatly assisted in coordinating regional activities. An increasing role is envisioned for scientific and educational societies in this regard.

35. In the current era of constrained resources, is it appropriate to use Federal funds to promote cooperative regional research to reduce unnecessary duplication; and to what extent is it appropriate to use Federal funds to encourage consortia of states to establish individual centers of excellence to address common problems?

Cooperative regional research was unanimously endorsed. These programs have been particularly effective not only in reducing duplications but also in combining strengths available in various states to address critical issues in a concerted manner. Use of federal funds to promote regional research is certainly appropriate so long as the projects truly address issues relevant across state borders.

On the other hand, one respondent believes that there are very few examples of "unnecessary duplications". Two projects may have identical objectives but utilize different approaches and, therefore, are not duplicating. There is a serious problem, however, if the two research groups are not communicating.

Centers of excellence are appropriate in addressing specific areas with high cost. But, if these centers require a significant percentage of the funding, they can be a deterrent to creativity by defunding creative individuals outside the centers.

36. As societal concerns about natural resource use, rural development, animal well being, etc. are integrated into the USDA agenda, is there a role for "new" partnerships with the Federal sector?

The majority of respondents answered that new partnerships should play an **important role** in the future of the USDA. We are living in a time and age where integration of all concerns into systems is critical and the Federal sector should develop ways to **work collaboratively with non-government organizations** regarding the environment, rural society, and similar fields.

A minority stated that the greatest need is probably **not** for the formation of **new partnerships**. The greatest need is for a **better means to educate the general public regarding the focus of research.**

37. Other parts of the Federal Government sponsor research directly applicable to the food and agriculture system. The National Science and Technology Council is intended to address the coordination of related activities across agencies. How is this intended to work in the case of research and extension of food and agriculture? How well is it actually working? Are methods needed?

Agencies other than USDA can and should do research that has value to agriculture. However, it is important to realize that **different agencies have different perspectives and priorities** in respect to various items impacting food and agricultural systems. **Partnerships and linkages** need to be made and an **oversight body** might be effective in telling all parties concerned what is happening, if there is unneeded duplication, and whether collaborations across agency lines would help to increase the power and efficiency of research. **Joint funding** would also help in solidifying these partnerships.

38. Congress authorized the National Research Initiative (NRI) Competitive Grants Program at $500 million per year. If the NRI is to be fully funded, where in the USDA research budget could money be transferred from?

There was no clear consensus. The **majority** of respondents indicated that money should be transferred from **special grants** to the NRI.

Other suggestions included:

- Transferring savings from cuts to commodity price support programs.
- Transfer from USAID and BARD programs.
- The general USDA fund.
- Creation of an agricultural industry-commodity group endowment (from check-off fees). Although this may signal Congress to reduce federal support for NRI.
- Alter the NRI program to include both directed and competitive grants creating a research umbrella.

Qualifying statements:

- Money should not be transferred from formula funds to the NRI.
- Even at $500 million, the NRI would still be inadequately funded.

39. What other options for funding the NRI should Congress consider?

There was no clear consensus. Suggestions include:

- Interested non-government organizations.
- Savings from price supports being reduced.
- Increased funding from within USDA.

Qualifying statement:

- Increases should come from **non-CSREES** sources.

40. Have NRI appropriations been used to expand agricultural research or have they been used to continue existing programs?

NRI appropriations have expanded agricultural research. NRI funding has greatly expanded the fields of biotechnology, pest control, wetlands research, and soil and water quality (some of which was ongoing but extremely limited). Expanding existing research capabilities leads to the development of new knowledge which expands agricultural research.
Qualifying statements:

- Expanded research **efforts do not necessarily translate into specific products** that can be immediately be implemented in the field.
- Increased emphasis on **competitive peer-review** ensures productivity and maximum benefit from investment.
- To ensure that products are generated requires a more directed approach with those activities identified with expectations for outcomes.

Agricultural Research Service (ARS) Laboratories

41. Should the USDA have research laboratories or should it provide competitive funding to existing entities such as universities?

This should not be an either/or questions. The USDA should maintain ARS laboratories **as well as** fund existing entities such as universities. ARS labs should focus on areas of **national interest** and need, which are **not covered by existing research being done by universities or other entities**. **Competitive funding for entities such as universities is essential and appropriate.**
Qualifying statements:

- ARS labs are important but there are some aspects of ARS research that probably could be handled through competitive funding to universities.
- Without ARS labs, many states would be required to develop the same infrastructure to complete these activities.

42. Should more ARS laboratories be co-located at land grant universities? What should be the relationship between ARS and land grant university scientists? Between ARS research coordination? How can ARS laboratory functions be more effectively linked to State Agricultural Experiment Stations?

ARS labs should be **co-located at land grant universities**. There should be close relationships between ARS and land grant scientists. In many cases, ARS scientists at land grants are treated as faculty members. These relationships facilitate meaningful research that is of interest to both ARS and the university. AES and ARS leadership should evaluate areas for continued expansion of cooperative research efforts. ARS-AES co-authored grants should be increased to help facilitate coordination.
Qualifying statements:

- Large ARS labs should not be closed nor personnel moved to land grants. Not all land grant universities have equally conducive environments for ARS labs.
- ARS labs should be located at universities, but not necessarily land grant

universities.

43. Are ARS laboratory facilities effectively used in performing needed research? If not, please explain and offer suggestions for better use?

- ARS labs are effective in performing needed research. Enhancing cooperation between ARS and AES scientists would be an appropriate step.
- Some labs are effective and some labs are not. There are some labs that are located in the wrong places for their mission or insufficiently funded to make the most effective use of the facilities.

Extension Service (Extension function within CSREES)

44. The USDA Extension Service's (ES) mission is , among other things to disseminate research results to farmers and other customers. In your opinion, is the ES effective in carrying out this mission? (Please explain)

The responses were split with no consensus:

- **ES is effective** in disseminating research results to its customers although some roles have changed through time and will continue to change as knowledge and needs change. The linkage between extension personnel and researchers is an excellent mechanism for bidirectional informational exchange. Joint appointments have also facilitated this exchange.
- **ES has not been effective** in accomplishing its mission. ES definitely has not maintained close contact with the sources of research information. An ARS researcher of 33 years states that he has never in that time been contacted by ES to inquire of his research and he is expected to use time, which should be devoted to research, to participate in technology transfer activities.

45. Should the ES be involved in addressing the problems and challenges confronting urban populations?

Most respondents felt that ES should and, to some degree, has responded to some of the urban issues. One respondent qualified that such issues should involve agricultural production and products. Additional resources are needed to carry out this new role without abandoning the old role.

A minority replied that ES should confine its activities towards problems associated with production agriculture and, to a lesser extent, rural areas especially in view of the increasing demands placed on production agriculture as well as the rapid rate of technological change and the massive problems confronting urban America. Additionally, a multiplicity of agencies, organizations, and programs currently exist to address urban problems.

46. What if any role should ES play in dealing with the social issues facing farmers and rural communities?

Responses to this question were varied with no apparent consensus:

- ES should be involved in the social problems of the rural community but as a **neutral resource**. It should serve as an information source and as a facilitator of community meetings and organizations intended to instruct and organize for societal improvement. ES should not suggest nor attempt to direct change.
- Community and leadership development has been and continues to be **a major role of the ES** and has done an excellent job of meeting the challenge of its old role as well as these new roles.
- ES should not deal directly with social issues unless it has **well trained staff and internal expertise** specific to those issues. Developing programs without the proper expertise, funding, and organizational resolve will create more problems than it will solve. Recruiting trained professional from within the land grant system is a strategy that ES should develop.

47. Should the ES's mission statement be changed to focus activities on production agriculture?

Most respondents replied that, although the critical function of ES is production agriculture, its mission statement does not forbid it from becoming involved in **other rural issues**. One respondent stated that **ES should focus on production agriculture** and limit programs in which it has little or no expertise engaging.

48. What should ES not be involved in?

- ES should not be involved in **any other issues outside of production agriculture**.
- The issues that ES should or should not address must be **determined at the local level**. The "one size fits all" model is not appropriate for ES; national goals and priorities are needed to identify common areas of concern but they must remain flexible enough to address local needs and issues.

49. Do you have any suggestions on how USDA's dissemination of Federal agricultural research results can be improved?

- Develop a **linkage** between ARS and AES scientists that would facilitate a linkage to the Extension Service and distribution of information.
- The reorganization of USDA and formation of **CSREES** plus the implementation of **partnershipping** will enhance dissemination of ARS research findings.
- Selective releases to the **national news media** especially the press.
- **Electronic bulletin boards**.

50. Who is, or will be, responsible for developing a marketing plan for agriculture and its science and education programs to the American people?

All partners - **AES, ES, ARS, industries, and consumers**- should be equally represented and responsible for developing and implementing a marketing plan. Leadership should be provided at the national level with input from the local and state levels.

Current Research Information System (CRIS)

51. ARS uses CRIS to provide information about USDA research projects. How, if at all, do you use CRIS?

The CRIS system was primarily developed for the **information exchange among scientists** and, in this sense, **it is utilized and effective**. The system maintains an active data base on research activities primarily targeted for research exchange. It was not designed to provide information to the general public or the decision-makers and appropriators.

52. In your opinion, is CRIS effective in helping you obtain information on Federal agricultural research projects? If not, what changes are needed to this information system that would provide quality data on Federal and State agricultural research? (please explain)

CRIS does serve a vital function for researcher to researcher exchange but is not designed for the other roles presently being requested of it. CRIS should be revamped to combine the researchers' exchange and development of lay statements emphasizing the impact of research and the value of new scientific knowledge rather than developing a completely new system.

53. Is there/should there be an appropriate and adequate management information system (s) in place to report and collate results from Federal investments in research, extension, and higher education sponsored by the USDA (and related research agencies)?

There should be the development of a management information system to demonstrate the impact of agricultural research, extension, and higher education. Information systems should be developed to **maintain the specificity** required to show impact at the local, state, and regional levels. A number of informational materials have been developed that compile information but an overall system approach has not been developed. Serious consideration should be given to the present information being requested and gathered at all levels and combining it into **one system**. The increasing demand of time on research and extension personnel in putting together impact statements, contributions of activities, and the continual adding of layers and layers of reporting reduces the time to accomplish research and extension goals and oobjectives. Time is also a critical resource. GPRA is an example of adding reporting without assessing what information is already available from research and extension. Not to say that GPRA will not be useful in "telling our story" but it does add a new information system to our existing reporting system.

54. Does the CRIS system and other USDA reporting systems provide and adequate accounting of the research and extension work that is being done in America?

The continual bombardment for requests for information as well as misinformation circulated about research and extension work indicates that the present reporting systems are **inadequate and ineffective** in relaying our message.

International Relations

55. How can the USDA be most effective in the short and long term through its support of international activities?

USDA could clearly play a significant role internationally by supporting international agricultural research - if they identified that as part of their mission. Some of us are of the opinion that USDA may not view this as a core part of their mission, and hence their support is likely to be tepid at best. USDA clearly has a focused domestic agenda, and their international role is like to be principally devoted to the support of initiatives that will build new markets and promote sales of U.S. agricultural products abroad.

Short term support of international activities:

- Address international issues related to agriculture e.g. food security in sub-Saharan Africa through coordination of inter-agency activities.
- Develop mechanisms or on-going programs to address issues related to food security in the "hot spots" of the world,
- Formulate linkages with universities to address global issues e.g. The GREAN initiative. The GREAN initiative proposes to support collaborative research that will permit U.S. scientists to partner with scientists in developing nations on projects of joint interest -- largely those that serve both the advancement of science AND the development needs of the partner nation. the model is similar to the USAID-funded Collaborative Research Support Program (CRSP). An additional feature of this model is that it contributes to the development of the human potential of the partner nation (Through the mentoring relationship that evolves with the U.S. Scientist.) and the strengthening of the research institutions in the partner nations. Also, the collaborative model has often brought advantages back to the U.S. in the form of germplasm, new ideas, and useful technology, etc.. In the end, these sorts of collaborative relationships can lead to trading partnerships, etc.that will be good for U.S. agriculture, but this requires long term, sustained, predictable commitment that may be difficult for USDA to promise. Thus, USDA may not be the est support partner for international agricultural activities.
- USDA support might be useful is in the area of CREES project support through the Hatch project route (research) or the Smith-Lever (Extension) route. In both cases, it would be desirable if CREES would be clear about promoting the inclusion of an international dimension to the scope of work that is encouraged. In the past, the support for an inter-

national dimension in supported project activity has been ambiguous at best. under this scenario, the burden would fall to the scientist/extension specialties to justify the work that is proposed, but it is clear that this is a route that could serve to further internationalize the core activities in the Land Grant institutions.

- The ICOP group within NASULGC has also been promoting the GAP initiative (Globalizing Agricultural Programs), an effort to get international activity into the Farm Bill as part of the Congressionally-mandated effort of the Land Grant institutions. The GAP initiative seeks to provide a stream of funding to offices such as IPIA at Purdue to support a cross-section of globalizing activities. The idea is that a stream of funding should come to the campuses on a competitive basis specifically earmarked to support campus internationalization activities.
- Create interest among U.S. agriculturists regarding potential and opportunities abroad and to emphasize the importance of global economy.

Long-term support of international activities:

- Depoliticize activities and address genuine issues of global importance e.g. land degradation, agriculture and environmental quality,
- Develop a systematic program in international agriculture with regards to research and training,
- Provide training opportunities to domestic students in international agriculture in Africa, Latin America, Asia and Eastern Europe,
- Strengthen collaboration with universities to implement jointly formulated programs with regard to:
  (i) international curriculum development,
  (ii) visiting scholar program,
  (iii) meritorious scholarships for overseas students,
  (iv) long-term research program.
- It is extremely important that the USDA promote and facilitate the exchange of plant and animal germplasm in the international arena.
- The USDA should be involved in closely monitoring any outbreaks of new insect or disease pests in other countries that have the potential for spreading into the U.S.

56. Currently, UNSAID and other programs extend agriculture and agricultural development beyond the nation's borders. What continued or expanded role should USDA play in international research, education, and extension?

We are clearly in a global economy, and cannot afford to walk away from the many opportunities that are there for our principal clientele -- the U.S. agricultural community. Many of the **Land Grant universities** have recognized this new reality and have intentionally **internationalized their undergraduate curriculum**, encouraged faculty participation in internationally - relevant research with partners around the world, and added an international dimension to their outreach/extension message within the borders of their state. The USDA ought to take a lead in this effort, and GAP initiative mentioned above is one way that this might be done. The most important consideration in USDA assuming expanded responsibilities in this arena is that **the commitment** to these responsibilities **be sustained and long term**. International activities have suffered much in recent years by inconsistent support, a demand for quick results, and a general impatience with what appears to be slow progress. It must be understood by those in the funding stream that quick results in an arena as complex as international development do not happen.

The alternatives (and until recently most prominent) venue for involvement in international agricultural development activities has been USAID. However, the role of USAID in providing support for international agricultural activities through the universities has been grossly diminished in the past several years. This has been due partly to changing national priorities but is also motivated by the current political scene, and has been exacerbated by the perception with AID that universities do not always make reliable or helpful partners. The population and environment lobbies, together with the NGO community, definitely have a stronger voice in AID now than do the universities.

- The international support activities of **private foundations** and other federal agencies should be coordinated through communication between the agencies to maximize the utilization of resources.

- Viewed globally, U.S. agriculture shows many signs of a developing country -- export bulk commodities, import specialty foods. USDA could focus on the U.S. as supplier to the global market with near-the-end-of -the-process-chain products, rather than ship-loads of raw commodities.

- First, the USDA alone, has not and probably cannot be a major player in international R&D, especially if Congress will hold USAID accountable for **impact and sustainability verifications**. Much of the capacity development needed for sustainable economic growth were not benefactors from the USDA and there is no reason to believe they will so benefit in the future.

- Starting about 15 years ago, **USAID has increasingly been force to depart from the agency responsibility for international development** to an agency that must implement and play a big role in U.S. foreign political agenda. This is evident in their human resource makeup, their developmental agenda and how the agency is politically controlled by the Department of State and some elected political leaders.

- The present USAID developmental agenda is: a) economic growth, b) nutrition and health, c) environmental preservation, and d) development of democracies. There is no visible agriculture R&D portfolio, consequently there are **very few rural development programs** and **almost no agricultural sector programs**. This is targeted for developing countries where 60-80% of the populations live and work in rural areas.

- With our present limited horizon foreign policies USAID, as any agency would experience, has problems developing depth and continuity to programs, resulting continually implementing single issue programs. The FY95 USAID issue was family planning and you can rest assured that FY96 is going to be targeted on the rights of women, both of which have long been components of rural development and agriculture R&D programs. Much of this is congress large reductions in appropriations foreign for technical assistance, only 0.33% of the national GNP, the lowest of the 21 major donor countries, lower than even Ireland.

- Long-term agriculture R&D in both developing and developed (U.S.) must move to comparative commodity advantage production policies whereby **commercial agriculture** based on agriculture trade, not on based how U.S. can dump it's surplus production. This will require some changes in internal U.S. policies. For example: many countries with humid tropical climates have the natural and human resources to produce labor intensive natural rubber, a renewable resource. If the U.S. made a commitment to move to 50% replacement by natural rubber by 2010 and 755 by 2025 in a move to utilize renewable resources, many countries could move away from subsistence grain production to purchasing their needs from countries with the comparative advantage in grain production. The agriculture R&D agendas would then change to address this challenge and agenda.

- **USAID should not contract through USDA/RE** for long-term agriculture R&D because there will be another 36% overhead charge for all resources that pass on through, and the USDA track record for managing USAID funds has not been that accountable. Now with the cold war behind us it makes more sense to move USAID to an independent agency, like TVA, and move the politically controlled programs back into the state department and let USDA administer the accountability of the funds in these programs. I can think of two such large programs in specific for which there is almost no accountability.

- Just moving the administration of USAID agriculture R&D funds through USDA/RE will not solve the problem of dwindling support for foreign technical assistance and collaboration. If anything, it will more diffuse the rural development and agriculture R&D support base, a reason for less and less congressional support. Many other developed countries have independent International Development Agencies and they receive 1.00 to 1.05% of their GNP. Through this move they are able to keep the foreign politics out of daily operations of their international agriculture R&D and similar programs.

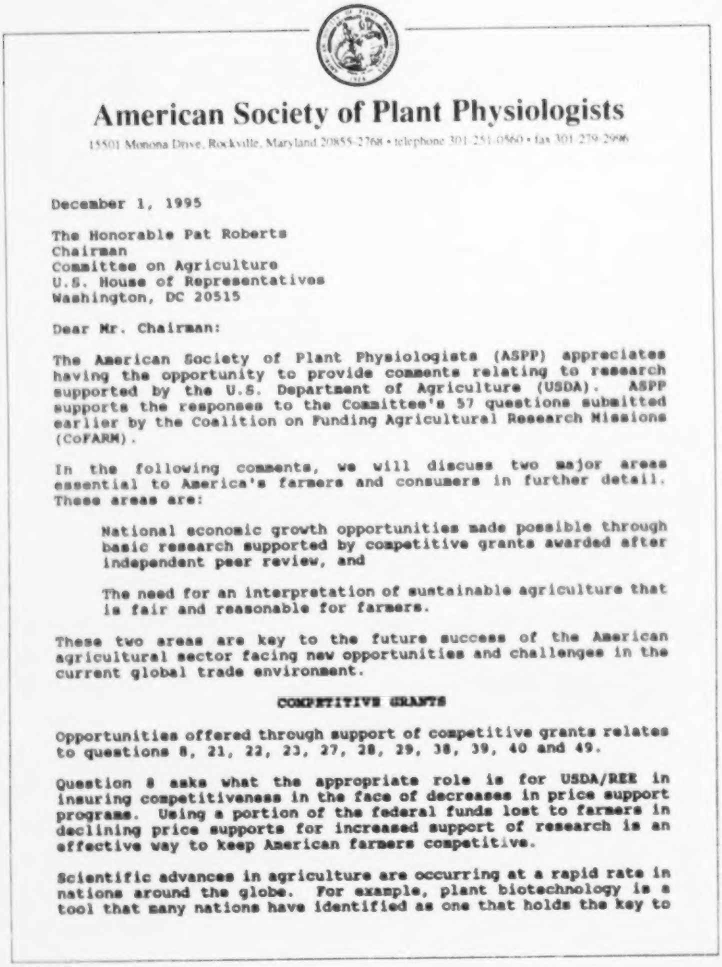
57. What is the role of UNSAID in funding agricultural research and extension? Had UNSAID maintained support for agriculture or has the agency moved away form agriculturally related programs? What is the role of long-term agriculture R&D in developing countries in developing new markets for U.S. products? Should UNSAID contract through USDA/REE for long-term agriculture R&D?

Clearly, long term agricultural research contributes to the building of national economies in impoverished countries. Most of these economies are built on agricultural production, thus this is the place to begin any effort to make a contribution to economic development. To the extent that the economies of impoverished countries grow, these nations will become players in the international marketplace. We ought to be there at the beginning of the process to be sure that we are also there when these nations enter the market in an active way. It should be noted that if we are not involved in this process, someone else will be. We should be first in line not last. **Participation in international development through a role for agricultural research must be viewed as in our own self interest**. Over the long term our involvement in international agricultural development can only be helpful in developing new market opportunities for U.S. agriculture. This has been seen repeatedly in recent years; perhaps the best examples are Thailand, Taiwan, Korea, and Malaysia - all previous recipients of U.S. foreign assistance, and all now important trading partners for agricultural goods.

The relative roles of USDA vs. USAID is not a question with a straight-forward answer. It seems to me that their respective roles ought to be complimentary. What is the comparative advantage of each? Where are there potential areas of overlap that should be avoided? Which does what better? What is the simplest, least bureaucratic way to accomplish our national goals in the international agricultural arena? These are the sorts of questions that ought to be asked and answered in an attempt to discern the roles of these tow agencies [Note that the players on the Land Grant university side will be the same regardless of the lead agency in Washington. There is report language in the Research Title of the Farm Bill presently before Congress that urges coordination of international agricultural research across agencies, and speaks specifically to the need for the Land Grant universities to be part of these coordinating discussions.] In the end, the U.S. MUST have a role in international agricultural development. It is in our own best geopolitical self interest, and it is also the right thing to do as a participant in the family of nations. The Land Grant universities are ready, willing, and able to provide some of the best expertise needed to accomplish these goals.

- USAID has moved away from agriculture in favor of sociology and the environment. It will inevitably discover that one cannot work on problems of environment and sociology in the countryside without also considering agriculture. On the other hand, to believe that improving only production agriculture will solve all problems in the countryside is also a mistake -- that seems to have been the earlier attitude. Rather than to try specifically to build new markets for U.S. products overseas, one should try to **improve LSD economies and society in toto**, knowing that this will increase their interactions with industrial countries like the U.S. Then let trade and commerce go where it will. USAID might well contract with USDA/REE for some long-term agriculture R&D, but beware of a single-customer relationship.

- Increasing effort should be devoted to **application of the Land Grant model** in developing countries and former communist countries. This dictates that U.S. Land Grant universities must be involved in these research and extension programs. Many developing countries and former communist countries have federal agricultural research and extension agencies but there is little, or no, coordination of their activities. Communication between researchers and extension specialists in these countries must be improved and this is the very heart of the Land Grant philosophy.



American Society of Plant Physiologists
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December 1, 1995

The Honorable Pat Roberts
Chairman
Committee on Agriculture
U.S. House of Representatives
Washington, DC 20515

Dear Mr. Chairman:

The American Society of Plant Physiologists (ASPP) appreciates having the opportunity to provide comments relating to research supported by the U.S. Department of Agriculture (USDA). ASPP supports the responses to the Committee's 57 questions submitted earlier by the Coalition on Funding Agricultural Research Missions (CoFARM).

In the following comments, we will discuss two major areas essential to America's farmers and consumers in further detail. These areas are:

> National economic growth opportunities made possible through basic research supported by competitive grants awarded after independent peer review, and
>
> The need for an interpretation of sustainable agriculture that is fair and reasonable for farmers.

These two areas are key to the future success of the American agricultural sector facing new opportunities and challenges in the current global trade environment.

COMPETITIVE GRANTS

Opportunities offered through support of competitive grants relates to questions 8, 21, 22, 23, 27, 28, 29, 38, 39, 40 and 49.

Question 8 asks what the appropriate role is for USDA/REE in insuring competitiveness in the face of decreases in price support programs. Using a portion of the federal funds lost to farmers in declining price supports for increased support of research is an effective way to keep American farmers competitive.

Scientific advances in agriculture are occurring at a rapid rate in nations around the globe. For example, plant biotechnology is a tool that many nations have identified as one that holds the key to

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future success in world agricultural trade markets.

The United States has a research community conducting research in university, ARS and industry laboratories that is second to none. However, a declining rate of federal support for agricultural research as compared to our trading partners, is keeping American farmers and consumers from recognizing the full potential of our world's leading agricultural research community. Higher crop yields along with more economically and environmentally sustainable agricultural practices are offered by research using biotechnology and other modern tools. Funding of agricultural research as a percentage of gross domestic product at a level consistent with some of our major trading partners is needed to help America's farmers survive.

A recent report by the Economic Research Service, The Value and Role of Public Investment in Agricultural Research (May 1995), explains how federal support in the U.S. for agricultural research is losing ground relative to other nations. For example, the report explains how two of our major competitors in the international grain markets, Canada and Australia, were spending about twice as much as the U.S. on research relative to the size of their agricultural economies. An investment in agricultural research here at levels equivalent to these trading partners could be expected to lead to significant increases in yields for America's farmers who would be growing newer, superior varieties of crops. This would help the U.S. capture emerging markets that have increased demands for superior food products.

The ERS report showed that even using conservative estimates, the rate of return on agricultural research is high. The report found returns highest for basic research. "Economic studies have found that basic agricultural research has about twice the benefit to society as more applied agricultural research," the report said. A summary of estimates of social rates of return for public support for basic agricultural research and development is 57 percent to 110 percent. ERS concluded that, "A high rate of return means that many beneficial projects are not being funded."

The federal government is spending a lower proportion of funds on agricultural research in relation to national personal consumption of agricultural products. Approximately four percent of all non-defense federally supported research and development goes to agriculture. In comparison, 16 percent of national personal consumption is for food; 7 percent is for clothing; and 14 percent is for housing, the ERS report noted.

With agricultural research contributing to sectors making up a combined 37 percent of the economy, increasing the share of federal non-defense support for agricultural research above four percent is warranted.

A report by the National Research Council, Board on Agriculture late last year, Investing in the National Research Initiative, An

Update of the Competitive Grants Program in the U.S. Department of Agriculture, found the need for increased support for competitive research within USDA. Following is a summary of a major finding by the Board of Agriculture in this report:

"...the board believes competitive grants are best suited to stimulating new fundamental research activities in specific areas of science. Compared to other mechanisms, competitive grants have three major strengths that work toward attainment of the goal of stimulating advancement in fundamental areas of science, thus advancing the frontier that defines the possibilities for technological innovation.

1. Competitive grants are responsive and flexible, permitting participation of leading-edge scientists as applicants and also as proposal reviewers and allowing adjustment in year-to-year funding priorities as scientific opportunity and national need dictate.

2. Such grants can attract a broad range of scientists (from public and private, agricultural and nonagricultural institutions) to the agricultural, food, and natural-resource system, drawing talent into new endeavors and into research on unresolved problems.

3. This grant program casts a wide net that captures research proposals that will aid in developing new alliances, new initiatives and new approaches complementary to those traditionally employed."

ASPP agrees with these findings by the Board on Agriculture. The Board on Agriculture also offered excellent insight in the original report, Investing in Research: A Proposal to Strengthen the Agricultural, Food and Environmental System, five years earlier when it said a portion of the reductions in spending on the Depression-era commodity price supports might be redirected to support agricultural research. This would alleviate the effect of cutbacks to farmers in agricultural commodity supports by enhancing the ability of the research community to help farmers compete.

When Congress in the 1977 farm bill directed USDA to establish a competitive grants program, its stated objective was to stimulate the development of fundamental scientific knowledge important to agriculture by adding extramural grant support. The urgent need for such competitive grants support of fundamental research expressed in 1977 followed the global food shortages of the early 1970s. The need to maintain a major focus on basic research continues today.

ASPP commends the Chairman for his interest in strengthening the competitive grants program. We urge the Chairman to continue a strong focus on basic research to best protect against future food shortages and farm failures.

SUSTAINABLE AGRICULTURE

Clearly, agriculture practices must be economically and environmentally sustainable to keep farmers in business. However it is important to recognize that, sustainable agriculture does not simply mean organic farming as some groups advocate. Mandates that would limit American farmers to strictly organic farming would likely have the effect of moving the world's breadbasket off our shores in just a few years. Inflexible mandates for organic farming would render many American farms as mere historical artifacts like some former American shoe firms or typewriter manufacturing plants that live on only in memory.

The loss of productivity that helped idle American steel manufacturing plants in earlier years could just as easily afflict mass numbers of American farmers. Agriculture maintains a trade surplus despite the fact that the American farmer often must pay more than global competitors for major expenses such as land and labor. The key saving factor keeping the American agricultural sector, not just afloat, but vigorous, is our world-leading research capability.

Some in the sustainable agriculture movement have criticized research for leading to costs for inputs such as seed. However, the global village has replaced the small country town as the community of trade. American farmers could not compete in the world market if they were denied productivity enhancing inputs developed through research.

Advances in plant biotechnology not only offer advantages in productivity, but also offer more environmentally sustainable practices. Crops engineered using plant biotechnology to more effectively resist disease, require less chemical inputs. Crops which will be engineered to better withstand drought, will result in less need to invest in irrigation equipment.

As Donald Plucknett and Donald Winkelmann explain in the article, "Technology For Sustainable Agriculture" Scientific American, September 1995, "The success of sustainable agriculture depends fundamentally on making plants more efficient in converting sunlight, nutrients and water into food and fiber products. Conventional plant breeding now boosts yields by roughly one percent annually. In the coming years, biotechnology can be expected to make breeding even more efficient." The authors call these improved crops, "power plants."

The Board on Agriculture in its 1994 report cited above, noted that a protocol that had been developed within USDA to evaluate the contribution of research to sustainable agriculture raises concerns. The controversial protocol unfortunately determined that fundamental research should be rated as having zero contribution to sustainable agriculture. The Board on Agriculture noted that such a protocol, with its emphasis on direct, near-term, impacts on sustainable on-farm production systems, fails to recognize the

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"indirect, yet powerful contribution of such basic and applied research over the long term."

ASPP worked closely with the Department in seeking needed revisions to the flawed protocol. The controversial protocol, which was drafted in part by representatives of one politically active segment of the sustainable agriculture community, would have produced an inaccurate assessment of the contribution of such research using biotechnology and other tools of the modern laboratory.

ASPP agrees with the need to develop economically, socially and environmentally sustainable agricultural practices. Whole farm societies, along with their social fabric, will almost certainly be eliminated as economically unsustainable in future years if they are denied the contributions that basic research will bring.

We encourage the Committee to include scientific research societies such as ASPP in the debate concerning sustainable agriculture. Sustainable agricultural practices must be a priority within the entire research community.

Again, the 5,000 plant science researchers of the Society appreciate this opportunity for comment. Please let us know if we can provide any information or assistance in the future. We commend you and your excellent staff for conducting this comprehensive study in preparation for revision of the agriculture research title.

Sincerely,

Ralph Quatrano

Dr. Ralph Quatrano, Ph.D.
John N. Couch Professor and Chairman of Biology
University of North Carolina, Chapel Hill
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Washington, D.C. Rep.

November 10, 1995

Dr. John Goldberg
Agriculture Committee Staff
U.S. House of Representatives
Room 1301, Longworth House Office Building
Washington, D.C. 20515-6001

Dear Dr. Goldberg:

I am pleased to submit responses from the Council on Food, Agricultural and Resource Economics (C-FARE) to 22 of the 57 questions on agricultural research and education distributed by Chairman Roberts on behalf of the House Committee on Agriculture.

As you may note from the selection of questions to which we responded, and the responses themselves, C-FARE is most directly concerned with the roles that economics and other social sciences can play in: designing strategic research agendas; producing research results of high public value; evaluating the agricultural research portfolio's progress in achieving public goals; and assessing rates of return to public investment in agricultural research and education.

As a supplement to our responses, we are also enclosing four reports, prepared by agricultural economists or agricultural economics organizations, which have direct applicability to a number of the issues raised by the questions. These reports are:

o *"Why Scientists Should Talk to Economists: The Role of Economics in Enhancing the Value of Publicly Funded Agricultural Research,"* by John M. Antle and Robert J. Wagenet. Published by the American Agricultural Economics Assoc., Ames, Iowa. 1995.

o *"The Value and Role of Public Investment in Agricultural Research,"* by K. Fuglie, N. Ballenger, K. Day, C. Klotz, J. Reilly, and J. Yee. Economic Research Service, USDA, Wash., D.C., Staff Paper No. AGES-9510, May 1995.

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o *"Agricultural Research and Development: Public and Private Investments Under Alternative Markets and Institutions."* Natural Resources and Environment Division, Economic Research Service, USDA. ERS Staff Paper No. AGES-9517, August 1995.

o *"Agricultural Research Evaluation: Principles, Processes, and Products,"* by George W. Norton, Philip G. Pardey, and Julian Alston. Paper presented at the C-FARE Symposium on Agricultural Research Assessment, Washington, D.C., August 29, 1995.

Within a few weeks, we will also be sending you and your colleagues copies of a summary and synthesis of the C-FARE sponsored conference on agricultural research assessment and accountability which we held in August of this year.

In the meantime, C-FARE offers its services, in any way you may deem useful, in assisting with the tasks of response sorting, summarization, synthesis, and interpretation that await you. Please contact any one of our Board members, or our Washington representative, Tracy Irwin Hewitt (301-441-8777), to follow up on this possibility.

Most sincerely,

Katherine Reichelderfer Smith
C-FARE Board Member

Enclosures

Question number 1:

What should be the role of the Federal Government in agricultural research?

Response from the Council on Food, Agricultural and Resource Economics (C-FARE):

Expenditure of Federal funds is justified for research that meets two basic criteria:

- The research addresses national needs and priorities, and
- The research is aimed at the generation of public goods.

It is only the Federal Government which is in a position to fund agricultural research that produces *public goods* (goods of a common property nature that do not provide the means for economic returns to private individuals and firms) which *know no political boundaries* (such as general improvement of nutrition for increased productivity of the American labor force) or which *cross political boundaries* (such as water quality improvement within a tri-state watershed). Neither private firms nor local and State governments have an incentive or a mandate to invest in research that provides such public goods. Thus, if the Federal Government does not fund research that produces national (transboundary) public goods, those goods are not likely to be available for the betterment of the nation's economy and citizenry.

Important categories of transboundary public goods include: (a) basic, freely available knowledge arising from research of too large a scale, too much uncertainty, or requiring too long a period of time to justify private investment; (b) knowledge, understanding, and technologies directed at publicly valued markets which are too small for adequate rates of return to private research investment; (c) reduction of negative nonmarket effects (such as pollution) or enhancement of positive nonmarket effects (such as provision of landscape amenities) of food and agricultural activities; (d) knowledge essential to the accomplishment of public goals such as social equity, economic efficiency, and informed public policy making.

Most fundamental (basic) research falls into the categories indicated above. Equally important, however, is integrative and applied research and technological development necessary for the provision of goods like environmental quality, resource conservation, or high levels of nutrition, for which no private, commercial market exists.

The national interest is well served by the devotion of Federal funds to agricultural research directed at public goods provision. Without Federal support, it is far less likely that the global food and agricultural system can assure adequate production to keep pace with anticipated global population growth of 100 million people per year over the next thirty years without significant, irreversible damage to the natural resource base. Future global political, social, and economic stability are necessary for the United States to realize expanded markets for its industrial as well as agricultural goods, and thus achieve economic growth. Yet these same global conditions are also absolutely dependent upon resource sustaining but high rates of food production, which will be possible only through advanced systems, practices, and technologies, and policy development that require research investment in the present time period.

Questions 3 and 4:

Is the process associated with the Food Animal Integrated Research for 1995 (FAIR '95) adequate for the development of Federal agriculture research goals? Are there goal identification processes which might better serve to enhance Federal agricultural research other than FAIR '95?

If the process of FAIR '95 were to be used to adopt an agenda for Federal agricultural research, how would the goals identified in FAIR '95...need to be modified to address the concerns of all research stakeholders?

Response from the Council on Food, Agricultural and Resource Economics (C-FARE):

FAIR '95 was a laudable effort by the animal science community to start coming to grips with its own research priorities. For purposes internal to that community, and as a first step towards consciousness raising about research issues in animal science, the process appears to have been very well organized and highly successful.

Two major limitations prevent the FAIR '95 process and its outcomes from having broader applicability. First, while the FAIR '95 process involved some representatives of other scientific disciplines and non-scientist stakeholding groups, the goal identification, aggregation, and prioritizing functions were governed by the animal scientists themselves. They were the principal decision makers, albeit with input from others. For a research agenda fueled in large part by public funds, this would seem to be the opposite of what should occur. The public goods nature of publicly financed research would be better served by a process that facilitated goal identification and prioritization by stakeholding groups, with input from the scientists, rather than the other way around.

Second, the usefulness of the outcome of the FAIR '95 process is seriously limited by the overwhelming comprehensiveness of its identified goals and by the failure to associate priorities with goals. It is doubtful that there is *anything* on which an animal science researcher might wish to focus that *isn't* covered by the six goals identified. While the goals do formalize the overall aims of the animal science professions, they provide no guidance or direction within the animal science communities or to funding agencies. Which of the goals are most important, and how does the relative importance of each relate to the others? What particular research questions within each of the six very broad categories deserves immediate focus through high levels of investment, and which are of lower priority?

Any process meant to enhance decision making about agricultural research directions and public funding would need to: (a) put a full spectrum of stakeholding groups in the driver's seat, with close interaction between stakeholders and a full spectrum of researchers, including social scientists as well as physical and biological scientists, and applied as well as basic researchers; and (b) be designed in a manner that allows for explicit ranking of discrete research priorities. To have lasting value, any such process also needs to be ongoing, include periodic evaluation, and explicitly incorporate the means for adjustment as scientific needs, public preferences, and/or other operating conditions change over time.

Question 5:

Is Federally funded agricultural research focused ont he issues of highest priority for producers, processors, and consumers? If not, how can the priority setting mechanism be improved to insure that these issues are addressed?

Response from the Council on Food, Agricultural and Resource Economics (C-FARE):

For many years, the nation has benefitted from agricultural research breakthroughs that have increased agricultural output and lowered the cost of food to consumers. Federally funded agricultural research has been a very significant contributor in accomplishing this goal. Today there is little concern that we cannot continue and build on this record of achievement.

Despite the success of agricultural research, questions are increasingly asked about its current and future direction. The problems of agriculture are changing. Today U.S. agriculture is facing a world of global integration, expanding and changing agricultural markets, and heightened environmental concerns. These trends manifest themselves in global markets that demand growing amounts of value-added agricultural products; an emerging environmental agenda that extends beyond traditional conservation concerns to water quality, wildlife habitat, and soil quality; and a demand for an expanding research agenda that emphasizes environmental protection, food safety, trade, rural communities, and profitable yet environmentally sustainable agricultural systems.

There is a concern that agricultural research priorities do not adequately reflect these new areas. For example, in 1994, of the approximately $3 billion this nation devoted to agricultural research through its Federal and state institutions, nearly 60 percent was allocated to research on crop and livestock production (production-increasing research), 12 percent to research on the environment, 5 percent on food safety, 4 percent on trade, and 3 percent on rural communities. In light of the changing conditions in U.S. agriculture a fair question to ask is whether present priorities reflect the major problems facing this industry. Output enhancing research will always be an important area of inquiry, the issue is one of balance with other important areas of research.

The issue of priority-setting mechanisms is addressed in question 15. It is important to recognize that research priorities are not determined in a vacuum. They reflect the demands of the industry that in turn is responding to signals from markets. And, for much of U.S. agriculture, market signals reflect in part the influence of government policy. For example, traditional government commodity programs provide incentives for increased commodity production even if world markets are moving toward non-program crops and value-added agricultural products. So in setting research priorities, it is important to recognize what is driving the research agenda as well as focusing on research priority-setting mechanisms.

Question 8:

What is the appropriate role for USDA/REE in insuring competitiveness in the face of decreases in support programs?

Response from the Council on Food, Agricultural, and Resource Economics (C-FARE):

The agricultural sector can be competitive based on its underlying comparative advantage in different commodities or through the provision of artificial competitiveness through subsidies. U.S. agriculture has long been one of the most efficient and productive agricultural sectors in the world. U.S. agriculture has had the benefits of publicly funded technology development and adoption and the protection of support programs. Both have been helpful in keeping U.S. agriculture competitive in a highly subsidized and protected world agricultural trading arena. As the federal government decreases agricultural subsidies and commodity price support programs and as the new world trading rules are in place, the sector will face increasing competition in both domestic and foreign markets. Continued public investments in high payoff agricultural research are needed to keep U.S. agriculture competitive. Additionally, research is needed to find reasonable balance between production efficiency, environmental issues and resource conservation. Most developed countries have been increasing public investments in agricultural research over the past two decades and many are investing a higher percentage of their GDP than the United States.

As other federal support to agriculture decreases, research investments must increase in order to ensure that U.S. agriculture remains competitive into the next century. The agricultural economics profession can be a critical link in providing analysis useful in allocating research funds to the areas of greatest potential payoff for both the agricultural sector and for the public interest. Additionally, the disciplinary research of social scientists is critical to achieving market oriented solutions to agriculturally related problems into the 21st century. Such analyses also provide information and data helpful in designing market oriented policies for the sector and social/rural development policies to enhance economic growth and other public goals.

Question 9:

How can the appropriate Federal-State-Industry resource pools be integrated to develop high priority regional programs in research, teaching, and extension?

Response from the Council on Food, Agricultural and Resource Economics (C-FARE):

Research spillovers, where results from one state's research are adopted in another state, are important. Individual states may not be able to capture economies of size and scope in research, teaching, and extension programs that pertain to larger jurisdictions. As a consequence, state level arrangements are often inadequate. Congress and USDA have adopted a variety of approaches to encourage multistate cooperation in agricultural research. Support for regional research in state agricultural experiment stations has been provided on a formula basis, as earmarked funds, and, more recently and to a limited extent, on a competitive basis. With a few exceptions, these regional efforts have not been successful at solving regional problems.

One alternative approach to regional efforts is embodied by the Sustainable Agriculture Research and Education (SARE) program. A key feature is a set of regional administrative councils that manage the SARE program and are composed of farmers utilizing systems and practices of sustainable agriculture, agribusiness, nonprofit organizations with demonstrable expertise, state departments engaged in sustainable agriculture programs, as well as leaders from the Federal and state agricultural research and extension systems. These regional councils are responsible for project review, selection, and recommendations for funding of grants to be awarded. A national advisory council is comparably composed and makes recommendations for project approval to the Secretary of Agriculture. Users of research are centrally involved in guiding the research program and full partners in it. This "market pull" approach contrasts with the "market push" of research findings separated from application. There may still be some question as to whether the SARE projects are truly regional in scope, but the model the program utilizes is worthy of examination as an appropriate means of Federal-state-industry pooling of resources for regional efforts in research, teaching, and extension.

Question 11:

USDA reorganization created the Cooperative State research, Extension, and Education Service (CSREES). In your opinion, how should this newly configured agency function to support the U.S. agricultural enterprise, 1995-2002?

Response from the Council on Food, Agricultrural and Resource Economics (C-FARE):

The reorganization combined three agencies with strong federal/state cooperation and funding into a single agency (CSREES). This combination not only increased efficiency in using headquarters' staff and overhead, but also was intended to address the issue of increased cooperation among federal/state programs in research, extension and education. U.S. agriculture is undergoing a quiet revolution as it adjusts to new domestic and foreign markets, new technologies, a more open trading environment, reductions in or elimination of government support programs, an expanding regulatory environment, and much higher levels of uncertainty. One of the major goals of USDA, according to Secretary Glickman, is to help "enable the private sector to adapt and change.... to meet the challenges of new competition and new opportunities."

The new CSREES should function as an integrated interdisciplinary and multifunctional unit to address the needs of the agricultural sector and all of its stakeholders in decisions affecting rural areas and people, the environment and resource use. CSREES has the institutions, human capital, technology, expertise and delivery system to provide the technology, education, and training needed to strengthen the competitiveness of U.S. agriculture into the 21st century. Simultaneously, the system must address the public concerns of resource conservation, food safety, the environment, and human capital development. The strength of the system lies in its interdisciplinary and multifunctional mission. However, the system must be truly linked (integrated) to achieve synergistic results.

The federal share of the federal/state investments in agricultural research, education and extension has continued to decline over time and currently stands at about 20 percent. However, a well designed national program with strong leadership can make a big impact on influencing the overall state/federal program and the outcomes of that program. However, the system must be more sensitive to the trade off implications of alternative policies, technologies, and production systems, on resource conservation and the environmental. The philosophy must shift from one where agriculture production and efficiency are the driving forces to one which has a more integrated, interdisciplinary and, ultimately, a more holistic approach to maximizing public goods. Economists and other social scientists can be of particular benefit in assessing alternatives and analyzing the returns to public investments in the CSREES system.

Question 15:

What options should Congress consider to improve USDA's process for planning and prioritizing agricultural research? (i.e. how should the research agenda be prioritized?)

Response from the Council on Food, Agricultural and Resource Economics (C-FARE):

As our response to question 5 notes, priority setting responds to a number of stimuli provided by markets, government policy, and advocacy groups. Beyond that, specific processes for collecting and synthesizing apparent and, especially, unrealized demands on the system can be useful or useless, depending upon how they are organized and conducted.

Presently there are many priority setting efforts that take place at USDA. These include priority setting efforts by each individual agency or program area (ARS, ERS, NRI), the state agricultural experiment station, and by outside advisory bodies (Joint Council, Users Advisory Board). Each arrives at its own list of priorities. Some question whether these efforts arrive at true priorities or a merely produce a list of research areas that can easily accommodate most current research activity.

The agricultural research system convenes many groups to conduct planning and prioritizing exercises. However, a question can be raised about the coordination of the results of these efforts and their implementation. With few exceptions, each segment of the research system develop its own priority list and implement its own program. No systematic coordination and implementation of research programs exists. The reorganization of USDA with all research under one Under Secretary may help. Congress could provide some incentive for better coordination and implementation by conducting oversight hearings, but should aim to stimulate coordinating and implementing mechanisms that are efficient, yet as open as possible.

Question 16:

What role should stakeholder advisory boards play in setting the agenda? What groupings should be represented on advisory boards? Can "customers" and "partners" be accommodated on one board or will it require two?

Response from the Council for Food, Agricultural and Resource Economics (C-FARE):

Advisory boards are useful and cost-effective only if: (a) there is an audience that is receptive to the advice and has a mandate to follow up on it; and (b) they are provided explicit guidance and adequate support to carry out a well specified task. Given these prerequisites (which do not appear to have been met in recent years), stakeholder groups can be extraordinarily useful in helping to set an agenda for the devotion of public funds to agricultural research and development.

Groups with a stake in the public goods nature of publicly funded agricultural research include:

- Agricultural businesses with both small and large markets
- Banks and other agricultural lenders
- Producers representing the full spectrum of scales of operation and types of producing organizations
- Environmental interest groups
- NGOs involved in the implementation of land, soil, and water conservation
- Food processors and commercial marketers
- Direct marketers of agricultural products
- Consumer, food safety, hunger, and nutrition interest groups
- Farm organizations
- Commodity groups
- Groups representing taxpayers' interests
- General public interest groups (e.g., The League of Women Voters)

While stakeholding groups are those which should logically have the greatest say about the direction of publicly funded research, there is a need for stakeholders to interact closely with "partners" and with members of the agricultural research community itself in order to assure that their advice is informed and relevant, and that it is feasible for funding decision makers and/or researchers to heed the advice.

The prerequisites of adequate recognition and support, and the need for coordination of stakeholder with scientist and partner views, all suggest that fewer advisory boards are better. We believe not only that customers and partners *can* both be accomodated on a single board, but that they *should*, for reasons of efficiency and improved communication, be accomodated on a single board.

Question 18:

What is the most appropriate mix of Federally funded basic and applied agricultural research?

Response from the Council on Food, Agricultural, and Resource Economics (C-FARE):

The distinctions of "basic" and "applied" are far too gross to act as a basis for research fund allocation. It has, in fact, been suggested that, because funds specific to basic research have been established (e.g., the NSF), and the private sector is likely to conduct any applied research on which it feels it can capitalize, the largest unmet needs exist in the areas of funding: (a) integrative research which adds value by pursuing a combination of independent discoveries from separate basic research endeavors; and (b) applied research directed at the provision of nonmarketable goods and services (such as environmental quality or enhanced nutritional levels).

Agricultural economic research has suggested that the returns to investment in basic research which manifests itself (following applied research, development, and technology transfer) in marketable goods and technologies, has generally been greater than those arising from investment in applied research which also realizes its benefits in private markets. We currently lack information on the comparative return on investment in research on truly public goods whose value cannot be measured in the marketplace. Economists have an important role to play in providing a fuller set of information on which to examine relative rates of return across private markets and public goods.

Economics also provides research institutions with the tools they need to be accountable. An essay by John Antle and Robert Waganet on "The Role of Economics in Enhancing the Value of Publicly Funded Agricultural Research" (copy enclosed) explains how economists can work with agricultural researchers in other disciplines to increase the likelihood that individual research programs, institutional research portfolios, or national research programs achieve a high rate of return on investment *in the public realm.*

The potential public value of such economic studies can be realized for more informed decision making only if such social scientific investigations are among those receiving adequate public funding. It is not obvious whether one would call such research "basic" or "applied."

Our position is that...

- o Decisions about the allocation of Federal funds among different types of agricultural research need to made in direct relation to (now unarticulated) goals and priorities of the Federal establishment in generating returns from investment in agricultural R&D; and

- o Once goals and priorities have been articulated, the types of research needed to accomplish them should be decided on the basis of a broad range of attributes including not only "basic," "applied," and "integrative," but also "social scientific" and "life science-based," disciplinary and interdisciplinary, and "individual scientist effort" and (regional or topic oriented) large group efforts.

Question 21:

In view of the growing emphasis on greater accountability on federal expenditures, do you have any suggestions on how agricultural research results can be measured and their impact evaluated? Is there some standard of accountability for the efficient and effective use of federal research funds.

Response from the Council on Food, Agricultural and Resource Economics (C-FARE):

Decisions about public funding of agricultural research increasingly rely on the anticipated value and usefulness of the research findings. Who will benefit, when, by how much, and what will the research cost, are key questions for scientists, policy makers, and research leaders throughout the agricultural sciences. So are questions about environmental impacts and broader social benefits. To answer these questions both ex-ante and ex-post assessments of research payoffs are receiving greater attention.

Agricultural economists and other social scientists have given considerable attention to the development of measures of research payoffs, including rates of return on research expenditures, distributions of research payoffs among producers, consumers, and other groups, and multiplier effects of research expenditures in regions, localities, and municipalities. The methods for generating these measures have received considerable study and have experienced substantial refinement in analytical approaches. The empirical results indicate consistently high levels of rates of return to producers and to consumers for various types of agricultural research. Generally, these are long term payoffs occurring over decades rather than individual years. Thus, long time periods are needed to fully assess the ex-post measures of research impacts. At the same time, however, the approaches to ex-post analysis have contributed to more accurate and timely ex-ante assessments of research payoffs.

We are enclosing a useful review document, "Agricultural Research Evaluation: Principles, Processes, and Products," that was prepared by George Norton, Philip Pardey, and Julian Alston for a recent C-FARE symposium on agricultural research assessment. Two excellent, in-depth references for research payoff evaluation are:

> Huffman, W.E. and R.E. Evenson. *Science for Agriculture: A Long Term Perspective*. Ames, IA: Iowa State University Press, 1993; and
>
> Alston, J.M., G.W. Norton, and P.G. Pardey. *Science Under Scarcity: Principles and Practice for Agricultural Research Evaluation and Priority Setting*. Ithaca, NY: Cornell University Press, 1995.

Question 24:

Should Federal funds be used for programs only, or facilities as well? If for facilities, how should they be allotted-- competitive proposals or other? Is there a place for regionalizing research, increasing competitive grants, etc.

Response from the Council on Food, Agricultural and Resource Economics (C-FARE):

This is a difficult question to answer by itself. It depends on the nature of the research, who benefits from it, and how the cost of the research may be shared between the public and private sectors. In some cases an argument can be made that federal funding should be used for facilities as well as programs (as in facilities that concentrate on resolving national and regional problems). In other cases (such as facilities concentrating on state or local problems), maybe not. To fully answer the question requires first answering a more fundamental question -- "How should agricultural research be financed, organized, and managed in the future"? Only after answering that question can a determination be made about the proper roles of such features as facilities, regional research, formula funds, and competitive grants.

In recent year, the agricultural sciences have increasingly been asked to do more with less. Questions have been asked about whether the old research institutions are still needed, and how they should adapt to accommodate changes in science, in scientific institutions, in society and social attitudes, in government, in agriculture itself, and in the general economy. To achieve the greatest gains for society as a whole, a fundamental rethinking of the basis for and approaches towards financing, organizing, and managing public-sector agricultural research is needed. Most frequently heard by policy makers is a call for more federal dollars for research--but that is only part of the solution. Other public mechanisms can and should be used along with taxpayer funds to increase the total private and public investment in agricultural research, and to promote a socially profitable mixture of research programs (from basic to applied; across disciplinary areas; and among production, trade, environment, food safety, and rural community issues). Important in this process is consideration of differing funding mechanisms--how they affect the cost of research (including who bears the cost in relation to who benefits), and how they affect incentives for private research and development.

A rethinking of policy extends beyond the boundaries of the current institutional structure, dominated by State Agricultural Experiment Stations and USDA intramural laboratories. Such an effort means considering greater use of in-between alternatives, such as regional research institutions, and allowing open competition among a broader set of research institutions, where appropriate, for the available funds.

Question 31:

Is the current formula for allocating Federal funds to land grant universities fair, reasonable, and does it address changing conditions? If not, how could it be improved?

Response from the Council on Food, Agricultural and Resource Economics (C-FARE):

"Fairness" is in the eye of the beholder. Beyond the obvious -- any cuts to individual states because of formula revision will be perceived as "unfair" -- our comments concern the efficiency and effectiveness of the formulas.

Even though the formulas have not been revised in decades, the formula funds provide a high degree of stability to university research and extension budgets, and a reasonable degree of responsiveness to shifts in the farm and rural populations that are the primary users of research results and extension education programs.

There have been proposals to change the formulas. For example, using share of farm income as a factor has been suggested. While such a change would shift monies toward states with concentrated commercial agriculture, it would reduce relative funding in states with many smaller farms. Population has also been suggested as a formula factor, with the rationale being the fact that the general public is the primary beneficiary of research and education. Such changes would tend to shift formula funding from "have not" Land Grant Universities to those with greater resources from all sources, including Federal grant funds. For example, 12 state experiment stations account for half of total USDA research allocations, but this is largely explained by the fact that they receive nearly 70% of USDA competitive grants.

It would certainly be appropriate to *evaluate* the impact of alternative formula mechanisms. The formulas have not been seriously addressed for 40 years, and the research-educational needs of the agricultural/rural sector have changed dramatically over that period.

High returns on investment in research and extension, reduced direct government support for the agricultural and rural sectors, limitations on state support, and high "spillover" benefits beyond individual state borders are all powerful arguments that Federal research and extension funding should be increased. To the extent that incremental funds are available, distribution by revised formula as well as grants in high priority areas should be considered. As an example, regional funding for extension, as is done with Hatch funds, would provide the incentive and means to employ multi-state extension specialists in areas of critical discipline needs. Most agricultural problems and solutions are more accurately defined within and across regions rather than in a particular state. Increased regional funding of research and extension would improve interuniversity collaboration and force administrators to specialize in areas with a critical mass of expertise.

Question 32:

The land grant universities have a system of agricultural experiment stations in each state. In today's environment of federal and state fiscal constraints, is such an extensive system of research stations still warranted (please explain)? Could certain functions be merged with other USDA agencies, other federal agencies, etc.?

Response from the Council on Food, Agricultural, and Resource Economics (C-FARE):

When the land grant system was developed, it was logical for each state to have a full service program of resident instruction, research, and extension and outreach education for the agricultural and rural constituencies of each state. Transportation and communication systems were less developed in those early times, and local problems were sufficiently unique to warrant the full service programs at the state level. Over the years, the degrees of communication and coordination among research programs in the respective states have evolved considerably, so that information sharing, coordination, and other efforts have largely kept duplication of programs and projects to a minimum especially when regional differences across the U.S. are considered. The concept of regional research projects has contributed significantly to communication, coordination, and collaboration among research scientists at neighboring and distant universities with common interests in approaches to solving similar problems.

Despite these features of unique responsibilities and functions in the respective states, it likely is the case that consolidation of programs and projects should receive ongoing attention. Further coordination and specialization utilizing unique research capabilities and resources is logical to expect, although the political realities of state autonomy, and the fact that the majority of experiment funding now comes from individual states are important factors to consider.

Question 35:

In the current era of constrained resources, is it appropriate to use federal funds to promote cooperative regional research to reduce unnecessary duplication; and to what extent is it appropriate to use federal funds to encourage consortia of states to establish centers of excellence to address common problems?

Response from the Council on Food, Agricultural and Resource Economics (C-FARE):

It is very appropriate to use federal funds to promote cooperative regional research and to encourage consortia of states to establish individual centers of excellence. This is exactly the role that federal support can effectively play. The federal/state partnership characterizing the U.S. agricultural research system has the advantages of bringing together members of professions with common bonds, it provides a comprehensive national network, and it provides significant motivations for scientific contributions to a national research system.

At the same time, however, federal funding used for these purposes should be accompanied by sufficient oversight to ensure consistent and effective dedication to the regional and consortia concepts by all of the participating parties. To work effectively, these approaches need to avoid free rider problems and perhaps function more like research contracts than research grants, although the grant concept makes the most effective use of scientific innovation and entrepreneurship.

Regional research and interstate pacts of various types have long been utilized in the agricultural research system, often with support provided by federal funds and with federal personnel providing administrative oversight. However, performance across these multi unit initiatives is often uneven and still largely determined by voluntary efforts of various research leaders. Thus, more effective use of federal funds in this regard might go beyond passive financial support to ensure that appropriate incentives exist to promote cooperative and collaborative work in the most effective fashion possible. In addition, new organizational arrangements (such as a regional competitive grants program) might be considered to assure more effective use of the regional research concept.

Question 38:

Congress authorized the national research initiative competitive grants program at $500 million dollars per year if the NRI is to be fully funded, where in the USDA research budget could money be transferred from?

Response from the Council on Food, Agricultural and Resource Economics (C-FARE):

Originally, the NRI was intended to represent new funds allocated to support the intended research initiatives. Failing the availability of new funds, further increments to the NRI would have to come from other program areas within the USDA research budget. Fund reallocations from other USDA agencies might be considered if the goal is to provide the most effective balance of funding channels to support research in the agricultural research system. If the goal is to provide a larger proportion of funds through competitive grants, then selective or across-the-board reallocations from other agencies and programs would be needed to accomplish this goal.

Question 39:

What other options for funding the NRI should Congress consider?

Response from the Council on Food, Agricultural and Resource Economics (C-FARE):

The agricultural competitiveness initiative is a new proposal for an expanded program of agricultural research, extension and education that has come under legislative consideration. It is important to be aware of and understand this initiative's role in the 1995 Farm Bill deliberations.

The agricultural competitiveness initiative proposes an annual allocation of $500 million over 7 years to support an enlarged competitive grants program of basic and applied research, extension, and education for U.S. agriculture. The proposal is motivated by likely reductions of direct government assistance to the agricultural sector as part of the federal deficit reduction initiatives and by related needs for agricultural decision makers to enhance their managerial and competitive skills in a globalized, freer trade market setting.

The specific goals of the initiative are to increase the competitiveness of U.S. agriculture, enhance productivity, develop new value-added products, improve risk management, facilitate information and technology transfer, and deepen the investment in the human capital component of agriculture. Documented high payoffs from investment in U.S. agricultural research and education over the last 130 years clearly support the value of making these new investments. The annual appropriations of $500 million would be funded by allocations of funds released from the farm income and price support programs of the Commodity Credit Corporation.

C-FARE endorses the idea of an agricultural competitiveness initiative funded and operated as described above.

Question 40:

Have NRI appropriations been used to expand agricultural research or have they been used to continue existing programs?

Response from the Council on Food, Agricultural and Resource Economics (C-FARE):

All indications are that NRI appropriations have been used to expand agricultural research. Applicants for NRI grants are asked to document their research needs in considerable detail, and to vouch for the originality of the intended work, or to otherwise indicate how the funds will build upon the prior work and existing programs. In addition, applicants are asked to identify other sources of research funding they are utilizing.

These applications are reviewed in detail by panels of peer reviewers who are selected based on their qualifications and accomplishments in research areas related to the applications under evaluation. Through their knowledge of the literature and the credentials of the principal investigators for the projects in question, these peer reviewers are able to effectively evaluate the scientific integrity of each proposal.

Documentation accompanying NRI applications identifies evaluation factors to include:

> **Scientific merit of the proposal**, consisting of: (a) Conceptual adequacy of hypothesis or research question; (b) Clarity and delineation of objectives; (c) Adequacy of the description of the undertaking; suitability and feasibility of methodology; (d) Demonstration of feasibility through preliminary data; (e) Probability of success of project; and (f) Novelty, uniqueness, and originality.
>
> **Qualifications of proposed project personnel and adequacy of facilities**: (a) Training and demonstrated awareness of previous and alternative approached to the problem identified in the proposal and performance record and/or potential for future accomplishments; (b) Time allocated for systematic attainment of objectives; (c) Institutional experience and competence in subject area; (d) Adequacy of available or obtainable support personnel and facilities.
>
> **Relevance of the project to long range improvements in and sustainability of U.S agriculture or to one or more of the research purposes outlined in the applicable regulations of the NRI Competitive Grants Program description.**

Thus, it is well understood that NRI appropriations are to be used to expand agricultural research programs, and not to simply continue existing programs.

One programmatic constraint on the NRI is its statutorily defined program areas. Greater flexibility in the research agenda could be attained by incorporating a process that clearly links NRI program areas to emerging research priorities and effectively involves social scientists and others in *ex-ante* and *ex-post* research assessments.

Question 44:

The USDA Extension Service's (ES) mission is, among other things, to disseminate research results to farmers and other customers. In your opinion, is the ES effective in carrying out this mission? (Please explain).

Response from the Council on Food, Agricultural and Resource Economics (C-FARE):

Unbiased studies consistently show that farmers and other extension customers utilize extension programs heavily and that they value them highly. Our integrated research-extension education system is the envy of the world. Numerous success stories could be told. Some examples include recent system-wide research-based educational programs on issues and alternatives for the 1995 Farm Bill, programs transitioning agriculture through the farm financial crisis of the mid 1980's, IPM programs that have reduced farmers costs *and* the amount of pesticides applied. But the system is by no means perfect. Funding pressures in recent years have spread state and county staff thinly. Funding has limited emphasis shifts toward emerging customer needs involving environmental issues, food safety, financial management, and enhancing producer marketing skills. There is a 3-5 year "gap" required for meaningful research results that extension can take to the field. And in many cases, key research slots remain empty. In other cases, needed research skills lie outside colleges of agriculture, and thus, outside the control of research and extension administrators. Years ago, agricultural problems were less complex and farms were more homogenous in size. The research- extension support system was sufficiently linked to perform beautifully. Today, in plain speaking, the system may not mesh together well enough given limited resources, complex issues requiring multidisciplinary answers, and a diverse customer base.

The system has attempted to adapt. Increasingly, extension educators hold joint research appointments and are in part responsible for backstopping their own educational programs. Bench scientists are increasingly encouraged to engage in public services activities resulting in applications of their research findings. But the improvement is still needed in the system's abilities to anticipate research/extension needs and to shift/add resources into priority areas.

The system truly needs to become fully integrated. It has done a reasonable job at the individual scientist-extension educator level, but this integration has probably occurred despite institutional barriers, and not because of management innovations. Full integration at the Washington headquarters level is a positive move. Incentives to create more research integration at the state level need to be provided. In some respects, state research and extension directors are competitors for scarce federal and state funds as much as they are members of the same team.

Program leadership within CSREES to the system needs improvement. Communications up, down, and horizontally among the various institutions and USDA is critical. Meaningful communications must occur not just at the Federal administration to state administrative level, but at the discipline program leader to state extension specialist/researcher level.

Extension has taken the lead in adopting new technology for dissemination of research results. Computers, video, electronic mail and now the information super-highway are standard techniques in most states. Investment in the hardware and software for these media has probably come at the expense of human capital in the form of scientists and extension educators. Both the medium and the message are required for delivery of the sophisticated, in-depth programs, needed and demanded by today's farm, agricultural, and rural community customers.

Question 46:

What if any role should ES play in dealing with the social issues facing farmers and rural communities?

Response from the Council on Food, Agricultural and Resource Economics (C-FARE):

Extension's role in social issues has generally been and should continue to be confined largely to providing the knowledge base required for individuals and groups to make sound, informed decisions. It has the further obligation as a neutral party to serve as a facilitating force in resolving controversial public issues. Extension generally has not and should not, play an advocacy role in political solutions to social problems. Its role is one of education and facilitation. There is an extreme need within the system for more qualified Extension educators who can deal with complex controversial issues, and for a sound social/economic research base to undergird extension programs dealing with such issues.

Question 49:

Do you have any suggestions on how USDA's dissemination of Federal agricultural research results can be improved?

Response from the Council on Food, Agricultural and Resource Economics (C-FARE):

C-FARE represents agricultural economists who rely a great deal on data series and research reports generated by the USDA's Economic Research Service (ERS); thus our comments may not apply to USDA as a whole. ERS reports are disseminated both hard copy and increasingly in electronic form widely within the USDA-Land Grant System. Timely ERS reports are essential for further research and ultimately, for extension education programs across the country. ERS has been a pioneer in reducing dissemination costs and increasing access by making results available electronically.

Improved coordination between ERS, CSREES, ARS, and all other Federal agencies with research responsibility is imperative for ERS to focus on key problems and to disseminate its results in a timely and effective fashion. Augmenting the program leader staff in CSREES would improve this liaison function. The need is not so much for improved dissemination methods, but the assured continuation of timely, objective analyses of national economic problems and opportunities facing U.S. agriculture, rural America, and our natural resource base.

Question 54:

Does the CRIS System and other USDA reporting systems provide adequate accounting of research and extension work that is being done in America?

Response from the Council on Food, Agricultural, and Resource Economics (C-FARE):

CRIS is primarily a means for documenting research plans and selected output for scientific peers. It is adequate for no more than a gross accounting of federal expenditures and scientist years in research categories that tell the accountant nothing about goals, beneficiaries, or benefits. As currently designed and implemented, the CRIS system is wholly inadequate as a means for accounting for research outcomes, the positive payoffs or benefits of federal investments in research, education and extension programs. The current CRIS contains neither the data needed to assess the value of agricultural research investments or estimate the returns to alternative investments, nor the information required for developing priorities or allocating scarce public funds among competing research or education investment opportunities. Admittedly, CRIS was not designed to address these needs, and would require significant redesign to accomplish such results. Given improved and improving mechanisms of peer-to-peer communication outside of CRIS, and growing demands for research accountability, a major redesign effort is warranted. A far more comprehensive reporting and evaluation system than CRIS is required to provide sound and complete data and information for public and private decision making on research fund allocation.

The internal extension reporting system(s) developed through federal/state cooperation are plagued by the same problems as is the CRIS system. Neither CRIS nor any other internal reporting system contains the data required to evaluate research investments, assess stakeholder/user benefits, or determine the distribution of the benefits of public research and education investments among alternative public goals. As a result, another system must be developed or the current system must be subjected to major revisions in order to obtain the data to meet current research evaluation requirements or the mandated GPRA requirements for public investments in agricultural research, education or extension. A system which provides the needed data and one which reports the linked benefits, where appropriate, of coordinated research, education and/or extension programs would be of enormous value to public and private decision makers.

The World Bank
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November 6, 1995

Dr John Goldberg
Agriculture Committee staff
US House of Representatives
Committee on Agriculture
Room 1301,
Longworth House Office Building
Washington, DC 20515-6001

Dear Dr Goldberg,

In reply to the letter of the House Committee on Agriculture asking for my views on US support to agricultural research, let me first state that I am both honored and pleased to be asked American contributions to the international knowledge base relevant for agricultural development have been critical for the rest of the World In recent years, perhaps decades, the relative role of the United States has declined and I am very concerned by current prospects, both in terms of reduced budgets   for and declining commitment to the pursuit of scientific advances and technological development for agriculture

I found the list of questions developed by the Committee very thoughtful and comprehensive I am obviously not in a position to address all of them My comparative advantage is obviously related to the international dimension of agricultural research Perhaps, as background, I should indicate that prior to my joining the World Bank 7 years ago as Director of the Agriculture Department, I was a Professor of Agricultural economics in France and that I received a Ph D from Michigan State University at the beginning of my professional life

With the substantial budget cuts foreseen, I am convinced that the Committee will, as it should, be very hard nosed at eliminating waste and ensuring that future expenditures are geared to the US national interest, with particular attention to US agricultural interests My main point in writing this letter is that international concerns should play a prominent role in serving those interests This is obvious in the case of the concerns for competitiveness Experience shows that the competitiveness of agriculture in any country is enhanced by a dynamic public research system open to the international scientific community This is indeed the best way to exploit advances made elsewhere

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But participation in the global research effort geared at promoting agricultural production in developing countries is also in the long term US interest, and even-perhaps paradoxically- in the long term interest of US agriculture, because in these countries agricultural growth is often a necessary ingredient of general economic growth, which boosts, more than proportionately, the demand for food and thus creates or expands markets for US agricultural exports. I believe that these effects are now generally understood, they are well documented empirically, and they can be taken as given.

My concern is that the decline in the engagement of the US agricultural research effort in the international community will accelerate. I fear that budget cuts within USAID may affect the funding of the International Research Centers of the Consultative Group for International Agricultural Research (CGIAR) and of the Collaborative Research Support Programs (CRSP) which mobilize specific US land grant universities. My concern encompasses also the international engagement of US agricultural research teams affected by cuts in USDA support.

Involvement in the international research effort is indeed beneficial both for the promotion of economic growth in poor countries and for the spill over effects on US agricultural as illustrated by the following examples.

- The CGIAR International Research Centers, which have been supported by USAID over many years, have provided germplasm which is broadly used in U.S. agriculture today. For instance, CIMMYT germplasm is found in most soft wheat varieties currently grown in the Western United States. Similarly, drought resistance in sorghum and millet derived from international centers across the world has been incorporated into varieties that are broadly used in the U.S.

- Much of the natural genetic resistance to plant pests has been acquired through collaboration with developing countries which are home to the wild germplasm from which modern crops are derived.

- Knowledge of how to recognize, avoid, and, where necessary, eradicate exotic plant and animal diseases has been derived, in large measure, from research done in developing countries. A cadre of U.S. scientists experienced through their international involvement in recognizing and dealing with such pests, forms the first line of defense in protecting U.S. agriculture from the threat of their importation.

A profound transformation is taking place in agricultural research worldwide, leading to what I call the emergence of a global research system with a massive redistribution of roles among the various actors. The retrenchment of the US presence on that world scene should be worrisome to US policy makers.

Sincerely,

Michel Petit
Director
Agricultural Research

**INTERNATIONAL
FOOD
POLICY
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October 19, 1995

Dr John Goldberg
U.S. House of Representatives
Committee on Agriculture
Room 1301, Longworth House Office Building
Washington, D.C. 20515-6001

Dear Dr Goldberg,

I recently was passed a copy of the House Agricultural Committee's July 12 letter and the attached "Agricultural, Research, Education and Extension Questions for Discussion." My colleague Julian Alston and I have a book in press titled *Making Science Pay: The Economics of Agricultural R&D Policy* that was expressly written to address many of the questions for which the Committee are seeking answers. The book will be published by the American Enterprise Institute Press but it will not be available until early December. I have taken the liberty of including a copy of the manuscript in galley form. You will note that we include a comprehensive quantitative assessment of the evolution and current status of investments in public-sector U.S. agricultural research. We also place those public investments in the context of private-sector agricultural R&D investments in the United States and agricultural research investments the world over. We also provide an economist's perspective on many of the questions you posed. We restate the appropriate economic rationale for government intervention in agricultural R&D but conclude there is scope for considerable change in the way the U.S. system is financed, managed, and organized. We propose five principle types of changes to increase the economic efficiency of agricultural R&D

- an increased emphasis on economic principles, economic efficiency criteria, and an economic way of thinking in research planning and management
- an increased investment in agricultural R&D
- a greater use of check-off, industry funding

- an increased use of regional research organizations instead of national or state-based institutions

- a greater emphasis on competitive grants rather than special grants and formula funds

The rationales for and details of these recommendations are spelt out in *Making Science Pay* and included in summary form in the *Revitalizing R&D* chapter I have also included.

I also draw to your attention the work we recently completed for OTA under Mike Phillips' supervision. This was a comparative study across four OECD countries (United States, Australia, United Kingdom, and Netherlands) of the sometimes substantial funding, institutional, and organizational changes that have taken place over the past several decades regarding public sector agricultural R&D. The lack of change regarding the U.S. system is notable when compared with developments in these other countries. For example, we describe, discuss and evaluate the substantial changes that have taken place in the Australian system where industry groups now provide over 30 percent of the total funding to publicly executed agricultural R&D and play a more active role in overseeing and managing this research. I gather a summary version of our work has been prepared by OTA prior to their closure and is on its way to you and the Committee.

Finally, I note that Julian Alston and I, in collaboration with George Norton, published another volume earlier this year titled *Science Under Scarcity: Principles and Practice for Agricultural Research Evaluation and Priority Setting*. This book is targeted to research analysts rather than policy makers but does lay out in some detail an economic approach to research evaluation/priority setting issues. I enclose a copy of the contents pages to give you some idea of the subject matter covered in this volume.

I trust this material is of some help in your important work to carefully consider the policy options regarding U.S. agricultural R&D.

Yours sincerely,

Philip G. Pardey
Research Fellow

cc: Julian Alston

Enc.: a/s

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November 13, 1995

Dr. John Goldberg
Agriculture Committee Staff
U.S. House of Representatives
Room 1301, Longworth House Office Building
Washington, D.C. 20515-6001

Dear John:

Because I have been involved with two different organizations' efforts to respond to the research and education questions you prepared on the Agriculture Committee's behalf, I had planned to decline the personal invitation I received to respond. However, many of a number of organizational responses I have seen to date are, by necessity, "fence-sitting," designed to assure that they do not offend members of organizations that hold positions on one side of the fence or the other. This observation has led me to submit a late and definitely "off-the-fence" response in the form of a paper published earlier this year.

While the paper (copies enclosed) is titled "Making Alternative Agriculture Research Policy," its contents have immediate relevance to much broader research policy issues -- including a number of the issues raised by your questions.

I believe that at least one of the ideas it contains is quite novel. Specifically, I propose a "means test" for formula fund payment limitations to the states, based on states' demonstrated abilities/disabilities in competing for competitive research funds. This idea is akin to proposals to target Federal farm program support to particular types of farms, but has the advantage of releasing some formula funds for greater competition, without significantly harming the position of state agricultural experiment stations that would lose a portion of their formula funds.

I also discuss, in the paper, such policy possibilities as: making priority setting a precondition for receiving Federal research funds; mandating that Federally funded research programs be categorized by the specific public goals toward which they are directed; reforming the CRIS research reporting system in specific ways; and utilizing a two-tier review system for agricultural research competitive grants programs.

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Dr. Katherine Reichelderfer Smith
Director, Policy Studies Program

Contributions to the Wallace Institute are tax deductible.

Recycled paper

I am enclosing three copies of a reprint of the paper. In addition, and for your ease in sorting responses to various questions, I have also cut-and-pasted relevant portions of the paper under headings that indicate which of the 57 questions those excerpts address in some way.

Good luck in your efforts to organize and understand the many responses you must have received. While a formidable task, it should surely be interesting.

Best wishes,

Katherine Reichelderfer Smith
Director, Policy Studies Program

The following excerpt from: **Smith, Katherine Reichelderfer. 1995. "Making Alternative Agriculture Research Policy,"** ***American Journal of Alternative Agriculture*****, vol. 10, no. 1**, has relevance for issues raised by...

Questions 13, 15, and 16 regarding the role of stakeholding groups in Federally funded agricultural research priorities and processes.

Public participation in research grant reviews

The current advisory committee structure has failed to influence public agricultural research agendas significantly, in part because committees' advice comes before research program planning and carries no incentives for following the advice. Therefore, outside advisers, including those concerned with alternative agriculture, ought to be more directly involved in research planning and implementation. One way to do this is to build public participation into the review and selection of competitive grants. This would supplement rather than substitute for scientific peer review.

There already is precedent for public participation in the review of federally funded research. The National Institutes of Health (NIH), one of the largest federal contractors for basic and applied research, uses a two-tiered grant review process. This process was instituted because clinical research (the medical equivalent of applied agricultural research) did not fare as well as basic research under standard peer review. The new process relies on a scientific peer review panel to identify proposals with highest scientific merit. This panel passes its recommendations on to a second review committee that judges how well the most scientifically meritorious proposals meet institutional goals and priorities (National Institutes of Health, 1992). Two-thirds of the second committee are scientists whose specialties are not necessarily those addressed by submitted proposals, and one-third are members of the public who have interests in federally funded medical research. According to the NIH, "the dual review system, which separates . . . scientific assessment . . . from policy decisions about scientific areas to be supported and the level of resources to be allocated, permits a more objective evaluation than would result from a single level of review [and] provides the responsible NIH officials with the best available advice about scientific as well as social values and needs" (National Institutes of Health, 1992, p. 4).

There is no reason that a similar two-tiered review system could not be used to differentiate scientific truth from social utility (Chubin, 1993) when awarding competitive grants for agricultural research. Such a system would foster alternative agriculture research by facilitating meaningful participation by farmers and alternative agriculture proponents in setting the research agenda. Some combination of external, scientific peer review of USDA's intramural research program plans and public review for relevance would also be useful in guiding USDA researchers and insuring the greatest opportunity for promoting alternative agriculture in ARS, ERS, and the Forest Service.

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The following excerpt from: **Smith, Katherine Reichelderfer. 1995. "Making Alternative Agriculture Research Policy,"** ***American Journal of Alternative Agriculture*****, vol. 10, no. 1**, has particular relevance for issues raised by...

Question 15: What options should Congress consider to improve USDA's process for planning and prioritizing agricultural research and extension? (please explain)

Priority setting as a condition for receiving public research funds

Suppose that Congress required USDA and that CSRS required the SAESs to announce publicly a ranked list of specific institutional research priorities before they could receive federal research funds by any funding mechanism. Researchers at federal and SAES institutions where research agendas have not been set clearly or openly would now have a precise target toward which to aim new research ideas. Although researchers are motivated by peer recognition and funding opportunities, most would, when all else is equal, also like to be acknowledged as contributors to institutional goals. For them, clear institutional goals would be a boon.

Equally important is that public announcement of priorities would allow the interested public to react to an explicit rather than to an assumed research agenda. At present, the public has little information to react to beyond public relations material.

I am not proposing any federal direction, control, or authority over the priorities of federally funded agricultural research. The proposal would merely provide the missing incentive for institutions to identify research priorities systematically and to declare them publicly. Furthermore, no direct federal intervention would be necessary to shift priorities in a way the interested public prefers; the public would now have the necessary information to act on its own if it sees a shift as valuable.

The following excerpt from: **Smith, Katherine Reichelderfer. 1995. "Making Alternative Agriculture Research Policy,"** ***American Journal of Alternative Agriculture*****, vol. 10, no. 1**, has relevance for issues raised by...

Questions 19, 22 and 23 regarding the allocation of formula funds and guidelines for improving the efficiency and effectiveness of appropriations in various agricultural research funding categories.

Means testing for formula fund payment limitations

Given expected constraints on the growth of total federal agricultural research funds, some critics of the USDA-SAES system have proposed transforming all or some formula funding into special research or competitive grants programs. This could, for example, fund a substantially larger SARE program, or make new competitive grants available for agroecological research. Opponents of such a move suggest that a reduction in formula funding would "cause an increase in wasteful project-seeking resources and impinge upon the capacity of the States to serve local clientele groups" (Huffman and Evenson, 1993, p. 255). It might even prevent researchers whose independent investigations of alternative agricultural systems are supported by formula funding from continuing to pursue a long-term research plan free from the constraints imposed by shorter term grants.

Furthermore, some states' agricultural research programs would be devastated without formula funds. On average, about half of USDA funding and about one-third of all federal funding of agricultural research in the SAES system is distributed by formula, without effective federal influence on its use. However, the importance of formula funds varies substantially across states. Some SAESs rely on formula funds as the basis of their agricultural research program; others use them as a small but important supplement to more lucrative nonformula or nonfederal funds. Since the states that rely most on formula funding tend to be those in which small farms are heavily concentrated (Schweikhardt and Whims, 1993), eliminating or cutting the formula funding base across the board probably is politically infeasible, and could work against some alternative agriculturalists' goals.

A better alternative would be to place a cap on the formula funds going to each experiment station, with the cap going into effect only when the station received more than a specified share of its funding from sources other than federal formula funds. This would insure base formula funding for all SAESs and protect those that rely heavily on formula funds, but would release for other uses some formula funds that now go to institutions that compete effectively for other funding. In theory, the institutions that lose some formula funding would have the best chance to recoup it elsewhere. However, the funds recouped through special programs or competitive grants would address targeted priorities rather than being allocated at the discretion of the recipient institutions.

This idea is akin to proposals to target federal farm program support to particular types of farms. Its feasibility and desirability depend on two factors: how it would affect the geographic distribution of total federal research funding, and whether it might cause some SAESs to seek more grants outside the newly prioritized public agricultural research system. The latter would move some institutions even farther from the influence, however subtle, that federal funders can have in stimulating an alternative agriculture research agenda.

The following excerpt from: **Smith, Katherine Reichelderfer. 1995. "Making Alternative Agriculture Research Policy,"** ***American Journal of Alternative Agriculture*****, vol. 10, no. 1**, has particular relevance for issues raised by...

Question 52: In your opinion, is CRIS effective in helping you obtain information on Federal agricultural research projects? If not, what changes are needed to this information system that would provide quality data on Federal and State agricultural research?

Goals as the basis for public research decisionmaking

A possible supplement to the previous proposal is to mandate that federally funded research programs be categorized by the specific social goals toward which they are directed, rather than by broad subject matter or scientific discipline. This would require significant reform of the Current Research Information System (CRIS), the present way that federally funded research projects are summarized, categorized, updated, and reported. Reports on federally funded agricultural research are accessible to anyone who understands the complex CRIS system well enough to make an appropriately framed request. However, no periodic report is routinely prepared from the CRIS information and released for public examination.

Under CRIS, the principal investigator of each federally funded agricultural research project, whether conducted within a USDA agency, a state experiment station, or both, classifies it as falling within one of one hundred Research Program Areas (RPAs). Each RPA, in turn, falls under one of nine predetermined goals. For instance, CRIS Goal III is to "produce an adequate supply of farm and forest products at decreasing real production costs." It includes such RPAs as "Genetics and Breeding of Forest Trees", "Farm Business Management", and "Bees and Other Pollinating Insects." Although the present system does provide for some classification by goal, it is inadequate for assessing how federal funds contribute to research on the goals of greatest interest to the public, or to proponents of alternative agriculture. For example, if a project is classified within RPA 204, "Control of Insects, Mites, Slugs and Snails on Fruit and Vegetable Crops," under Goal II, "Protect forests, crops and livestock from insects, diseases, and other hazards," one cannot tell whether the project is directed toward increasing the efficiency of pesticide use or toward reducing reliance on pesticides to improve food safety.

Also, the CRIS goals are so limited and the RPAs so outdated that they cannot readily accommodate a range of modern research topics, such as livestock housing to improve animal well-being, the implications of agricultural industrialization for agricultural sustainability, or the agroecological consequences of alternative farming systems.

I propose three specific revisions of CRIS for improved accountability on research goals. First, each year, all principal investigators would be requested to state, in their own 25 words or less, the primary social goal addressed by their projects. Second, they would classify their project according to a substantially revised set of CRIS goals. The revised, updated, and more relevant set of CRIS goals should be developed by USDA with input from the alternative agriculture community and other constituents of the agricultural research system to insure that the goals are appropriate for current issues. Finally, the allocation of federal agricultural research funds would have to be reported according to (revised) CRIS goal categories to provide needed accountability to national priorities.

The benefits of these proposed actions would be twofold. First, requiring researchers to articulate their research program in terms that are meaningful to the public, besides those their scientific peers can understand, would be a small but possibly significant stimulus for researchers to shift their personal agendas toward public priorities. Second, it would create a more relevant basis for judging how well federal agricultural research programs meet Congress's intent regarding alternative agriculture and other socially motivated directions for agricultural research. Better information for alternative agriculturalists and public citizens to get involved in the public agricultural research process would be an important byproduct of these proposed policies.

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SUSTAIN
SHARING UNITED STATES TECHNOLOGY TO AID IN THE IMPROVEMENT OF NUTRITION

November 3, 1995

The Honorable Pat Roberts
Chairman
House Agriculture Committee
1301 Longworth House Office Building
Washington, DC 20515

Dear Mr. Chairman:

We are please to provide the attached information in response to a series of questions transmitted to us by Dr. John J. Goldberg of your staff. The questions SUSTAIN is most qualified to address are as follows:

55. How can the USDA be most effective in the short and long term through its support of international activities?

56. Currently, USAID and other programs extend agriculture and agricultural development beyond the nation's borders. What continued or expanded role should USDA play in international research, education, and extension?

57. What is the role of USAID in funding agricultural research and extension? Has USAID maintained support for agriculture or has the agency moved away from agriculturally related programs? What is the role of long-term agriculture R&D in developing countries in developing new markets for U.S. products? Should USAID contract through USDA/REE for long-term agriculture R&D?

The attached paper provides SUSTAIN's observations and input. If SUSTAIN volunteers can provide any further information or insight to you and the Committee as you prepare for future hearings, please contact us.

Sincerely,

Elizabeth Turner

Elizabeth Turner
Executive Director

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SUSTAIN
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202 638-6222 · FAX 202 628-6726

International Trade and Development Through Food and Agriculture: Improving Food Safety, Quality, and Nutrition in the Balance

USAID's and USDA's future effectiveness in international trade and development assistance will depend increasingly upon their abilities to develop collaborative relationships and catalyze outside resources. To do so, they will need to initiate and maintain successful joint activities with private voluntary and non-governmental organizations, donor countries, multi-lateral development institutions, private-sector cooperatives, and businesses. Increased reliance on collaborative initiatives and private voluntary actions will provide more cost-effective technical assistance. It also establishes a starting point for identifying and building commercial relationships at a people-to-people/business-to-business level between U.S. and developing countries' private sectors.

SUSTAIN (Sharing U.S. Technology to Aid in the Improvement of Nutrition) nourishes people and develops economies through the voluntary efforts of 200 leading U.S. food scientists. SUSTAIN is a private/public partnership that builds better markets, stimulates economic growth, and improves purchasing power. SUSTAIN was started by volunteers from the U.S. food industry and USAID's Office of Nutrition in the early 1980s. SUSTAIN works with funding from USAID and USDA to provide technical assistance, training, and problem solving for food businesses in Central America, Africa, Asia, and Eastern Europe. With contributions donated by volunteers and U.S. food companies, SUSTAIN leverages Federal funds by more than $1-to-$1. Internationally-recognized on food and nutrition issues, SUSTAIN is a unique and cost-effective voluntary resource, unreplicated throughout America's trade development and foreign assistance programs. Its vision is "to ensure access to a good, safe food supply shared by all people." Its mission is "to help improve the safety, quality, and availability of food and nutrition in developing countries."

With the great strides globally in democratization during the past decade, we now see the evolution of international assistance from an emphasis on "Emerging Democracies" to "Emerging Markets." U.S. foreign assistance works best when it works both for us and for countries we assist. International marketing increasingly is relationship-driven rather than transaction-based. International marketing encompasses trade activities (exports/imports) but extends beyond them to joint investments and other business initiatives. Both USAID and USDA offer unique technical knowledge and institutional relationships with developing countries. Their in-country relationships provide a valuable foundation for building future growth, both for developing countries' and U.S. economies. Strengthening private-sector economies at home and abroad requires strengthening relationships with and among business institutions, universities, governments, and non-governmental organizations to support international marketing. SUSTAIN can be an increasingly valuable resource for USAID and USDA as they continually work to improve relationships at field levels as well as in Washington. SUSTAIN is a mechanism for technical assistance for USAID missions and USDA field offices as well as a resource for addressing technical issues with food aid commodities.

When it comes to relationship-based marketing at an international level, the United States is at a comparative disadvantage. Many emerging markets have far greater affinities for trading with countries which share their languages, cultural traditions, and histories. For example, Latin American countries are at an advantage over the United States in competing for emerging Central American markets, as is borne out by a review of recent investments in the food processing sector in Latin America. Initiatives such as SUSTAIN leverage and extend scarce Federal resources through voluntarism to achieve U.S. international economic objectives (trade as well as development assistance). SUSTAIN emphasizes enduring commitments. SUSTAIN volunteers create lasting relationships with local businesses, voluntary organizations, and scientific institutions to build their capabilities.

Government is attempting to do a better job of coordinating information on trade among Federal agencies through such structures as the Trade Promotion Coordinating Committee. Much is made of "strategic alliances" to accomplish mutual objectives. Expanding dialogue on an advisory basis with SUSTAIN volunteers and others knowledgeable about international food and agribusiness as well as international development assistance can enhance the government's approach to achieving trade and development assistance goals.

SUSTAIN enhances economic development, particularly through small food processing businesses, and broadens the entrepreneurial base to participate in open markets. It is important for these businesses to share in the benefits of increased world trade. This will require a better-trained workforce with knowledge of good manufacturing practices, for example, and improved infrastructures including quality assurance and testing laboratories. SUSTAIN helps food processors add value to their products by elevating the capacities of small and medium-sized businesses in developing countries to process and preserve foods safely, nutritiously, and cost effectively. **As domestic capacities increase, reasons to create trade barriers to bar competitive products from the outside diminish. As a result, developing countries become more open trading partners.** Assisted businesses become potential suppliers of products, joint venture partners, and customers for U.S. goods and services. With the completion of historic trade agreements such as GATT and NAFTA, to name just two in recent years, many macro-level issues have been addressed. To realize the promise such treaties portend, attention now must be paid to issues at micro-levels.

It is important for small and medium-sized businesses to have greater opportunities for profitable participation in domestic economies if we are to prevent disease, hunger, and malnutrition. Without economic growth, developing countries can do little to help themselves, little about their poor and hungry, little to participate in the world economy. Food aid needs are projected to double in 10 years. Sufficient aid may not be available to address all of these needs. SUSTAIN not only benefits recipients of its expertise in such places as Central America, the Caribbean, Africa, and the Pacific Rim, SUSTAIN volunteers gain insights into other cultures' businesses, institutions, and international markets. While participating in a worthwhile humanitarian mission, U.S. volunteers establish relationships at the foundations of economies, at levels which must improve for indigenous businesses to survive. And, volunteers develop valuable insights into these cultures, markets, and economies which they bring back to their sponsoring companies. For example, while working in Guatemala to enhance the nutritional properties of baked goods for school feeding programs, SUSTAIN broadened the capabilities of small bakeries. A wheat-deficit country, Guatemala has a capacity to grow only 20% of the wheat it needs. Building the capacities of indigenous bakeries and establishing relationships with them opens the opportunity for sales of U.S. wheat to Guatemala.

Developing countries' markets yield prospects for trade relationships long term. By the year 2000, 4 out of 5 of the world's consumers will live in developing countries. These markets already account for half of U.S. agricultural exports and 30% or $127 billion worth of all U.S. food and non-food exports. A 50% increase in U.S. exports would boost farm income 13%, create 378,000 off-farm jobs, and add $50 billion in GDP. With exports expected to represent a growing share of farm and rural income, the future of the U.S. food system, an economic sector which employs 18% of all Americans, will hinge on success in the international marketplace.

This Committee long has been supportive of addressing hunger, nutrition, and agricultural productivity needs of developing countries through the programs of USAID and USDA. As a direct result of supportive policy, pioneering science and research, and sound technical assistance delivery, crop productivity has improved. While research, education, and extension efforts in production agriculture merit continued support, **there is a huge and much less recognized need to focus on activities beyond the level of crop production -- namely, food processing, fortification, preservation, and delivery. Focusing on steps beyond the farm level are critical to elevating nutritional status, alleviating hunger, sustaining economic development, and enhancing future success of value-added trade.**

Lack of access to scientific knowledge, business skills, technology, diversified markets, and trade constrains developing countries from producing, preserving, and purchasing enough food. SUSTAIN volunteers teach seminars, train trainers, provide one-on-one technical assistance to businesses, and advise governmental institutions. SUSTAIN's volunteers are scientists, business executives, and technical professionals from U.S. food companies who have the knowledge, technology, and desire to help end world hunger. SUSTAIN helps prevent foodborne diseases, micronutrient deficiencies, and spoilage of scarce food resources by elevating the capacity of small businesses in developing countries to process and preserve foods safely, nutritiously, and cost effectively. SUSTAIN addresses food security by raising developing countries' capacities to help themselves and to preserve food which is now going to waste.

Food inavailability, while widely recognized, is only part of the complex dynamics of hunger. Food quality and safety are other major factors. U.S. food scientists possess the knowhow to address micronutrient-deficiency and foodborne diseases widespread in developing countries. Programs which transfer knowledge and technology are greatly needed. The impact of unsafe foods on health and economic productivity is debilitating. Acute diarrhea -- a significant proportion caused by microbially-contaminated foods -- afflicts more than 1 billion children yearly, killing more than 5 million. Diarrheal disease intensifies malnutrition by harming the body's ability to metabolize already inadequate diets. Malnutrition retards mental

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development, physical growth, and disease resistance in children. In adults, it reduces productivity. Other foodborne diseases include botulism, typhoid fever, and parasitism. Chemical contaminants cause chronic health conditions. Without a sustained effort to improve food by 2020, 25 million children a year will die of malnutrition and infectious disease as world population increases by 50% -- to 8 billion, with 1.5 billion malnourished.

SUSTAIN is part of the answer. Members of Congress and the White House have cited SUSTAIN as "a tremendous resource." Improved nourishment not only makes people healthier but economies healthier. Food and agriculture are the "engine for economic growth." In developing countries, agriculture accounts for 40 - 85% of GDP. Improving food production jumpstarts economies. Up to 70% of disposable income is spent on food. Income freed from this expense is available for domestic and trade spending.

In a recently-released strategy statement, The World Bank emphasized the need for rudimentary health care and nutritional education in addition to economic growth as components of reducing poverty and hunger. Understanding and attending to concerns about nutrition, diet, and health are ways to prevent diseases. **Preventing disease is far less costly and more effective than attempts at remediation of disease. Comparatively little attention is given to food as a means of nutrient delivery and diet as a way to propagate health.** In the United States and other developed economies as well as in developing countries, recognition and consumer demand are growing for foods with health attributes. Nutritional needs and dietary deficiencies of developing countries' populations are well researched by USAID and other agencies.

SUSTAIN believes that local food industries can -- given appropriate assistance and technology transfer -- translate that research knowledge as well as growing indigenous marketplace demand into improving food supplies in ways which will reduce deficiency diseases, optimize health and wellness of local populations, and foster economic development.

In this era of declining federal international development assistance resources, it is crucial to recognize and extend benefits derived from cost-effective, voluntary programs in addressing trade concerns and food, nutrition, and poverty issues associated with development assistance. Small investments in SUSTAIN pay enormous long-term dividends for developing countries as well as ourselves.

(11/9/95)

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November 3, 1995

Committee on Agriculture
Mr. Pat Roberts, Chairman
Mr. E. de la Garza, Ranking Member
Mr. Wayne Allard, Subcommittee Chairman
Mr. Tim Johnson, Subcommittee Ranking Member
U.S. House of Representatives
Room 1301 Longworth House Office Building
Washington, DC 20515-6001
FAX: 202-225-0917

Attention: Dr. John Goldberg, Agriculture Committee staff

Dear Sirs:

Thank you for the opportunity to respond to the Committee's "Questions for Discussion" on Agricultural Research, Education and Extension. The following document responds to many of these questions, though we did not feel competent to respond to all of them. A hard copy of this response will follow by mail. We hope you will find our effort useful in the months ahead. We look forward to assisting you in any way we can as you consider the Research Title. Please feel free to call on us.

Sincerely,

Elizabeth Ann R. Bird

Elizabeth Ann R. Bird, Ph.D.
Project Leader
Research and Technology Policy

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Response to "Questions for Discussion" posed by the U.S. House of Representatives Agriculture Committee, on Agricultural Research, Education and Extension:

1. What should be the role of the Federal Government in agricultural research?

The Federal Government should fund research that serves national interests (for example, environmental quality, a vital rural economy), research which would have no profit motive for private industry (both basic and applied), and research that has benefits beyond state lines (for example regionally based programs). The Federal Government also should provide extra opportunities for research development in resource poor states.

3. Is the process associated with the Food Animal Integrated Research for 1995 adequate for the development of Federal agriculture research goals? Are there goal identification processes which might better serve to enhance Federal agricultural research?

We have two concerns about FAIR '95 as a model for the development of Federal agriculture research goals. First, the range, mix and impact of participants in a consensus building process is important. The FAIR '95 publication states that participants included "scientists, food animal producers of small and large enterprises, food processors, food commodity association representatives, aquaculture specialists, and advocates from consumer, environmental, and animal well-being groups." We're concerned that the list is incomplete. The full range of interests and perspectives within each grouping should be represented in a process to set public research priorities. Within the category of "producers," for example, the full range of production systems and scales of production, and the full diversity of farmers should be represented. In addition, groups most notably missing were rural community development advocates, general farm organizations (e.g. National Farmers Union, National Family Farm Coalition, sustainable agriculture organizations), and agricultural workers (in both production and processing sectors).

Beyond the source groups of participants in a priority-setting process is the question of the mix and relative power of these groups. It is important that not only are all perspectives represented, but that the number of representatives of these groups, the mix, is balanced so that none are easily marginalized. Likewise important is that all groups and individuals participating in such a process can say the outcome is truly representative. Each must be able to buy into the consensus report emerging from a symposium such as FAIR '95.

Our second concern about the FAIR '95 approach to federal priority-setting is that it was private and ad hoc. It should be linked to Congressional deliberations. The process also should be systematically integrated with USDA decision-making processes. For a participatory agenda-setting process to be meaningful, it must be more than a wish-list generator. The government can never afford to fund everything, so real priorities must be set, according to agreed-upon national goals. In addition, the process should take the form of a dialogue with USDA planners about what can and should be done, through what programs and mechanisms, at what level of funding, and when.

4. If the process of FAIR '95 were to be used to adopt an agenda for Federal agricultural research, how would the goals identified in FAIR '95 and listed below, need to be modified to address the concerns of all research stakeholders?

The goals identified for Federal agricultural research by FAIR '95 do not encompass the full range of USDA's responsibility to society. There is no mention in the goals of 1. increasing income and employment -- especially self-employment -- opportunities in agriculture and rural communities, and 2. promoting rural community development especially through import-substitution strategies, value-adding strategies linked to local agricultural production, and the creative utilization of local resources. Also missing are the goals of enhancing the long-term viability of the food and agriculture system, and enhancing human health, both the health of the citizenry at large (including adequate access to nutritional foods), and the health of farmers, farmworkers and rural residents. We also have concerns that strategies to "meet market demands" excluded market differentiation strategies (niche marketing), and appeals to customer values.

5. Is Federally funded agricultural research focused on the issues of highest priority for producers, processors, and consumers? If not, how can the priority setting mechanism be improved to insure that these issues are addressed?

It is not focused on the issues of highest priority for producers and consumers. Grassroots listening sessions and organizations consistently point to the need for more agricultural systems research oriented to integrating environmental and economic values, and research that helps farmers and rural communities add value to their products and engage in creative marketing. Not enough of the research is oriented toward enabling moderate sized farms to use their management and skills more effectively to generate a higher income over a given set of resources by cutting input costs and improving the efficiency of resource. Consumers want more research that promotes food quality and locally produced fresh produce, and research that addresses the health effects of multiple and interacting chemical contaminants in water and food. USDA's priority setting mechanisms could be improved by more fully involving the full range of stakeholders in research planning and development, and research evaluation. They also could be improved by being more carefully linked with broad national purposes such as were enumerated in the 1990 farm bill.

6. Should Federally funded agricultural research address specific technological and industrial needs? If yes, does the present system fulfill this goal (if not, please describe how this can best be accomplished)?

Federally funded agricultural research should develop knowledge and technologies not likely to be developed by private industries drive by the profit motive. Public sector research should include much applied research that helps farmers improve their income by reducing costs. Most farmers don't have the resources to do or contract their own research -- they require public sector assistance. Federal research should address sustainable agriculture needs. Currently the system only marginally addresses this goal with inadequate funding for the Sustainable Agriculture Research and Education program, and inadequate attention to supporting stewardship options, integrated resource management options for beginning farmers in the Agriculture Research Service.

7. Does Federal agricultural research adequately address projects that result in quantum leaps in benefits, or does it dwell too much on incremental benefits?

The Agricultural Research Service should place a higher priority on designing farming systems that enable farmers to use their skills and management to capture a larger share of the farm dollar, and that provide greater self-employment opportunities in farming.

8. What is the appropriate role for USDA/REE in insuring competitiveness in the face of decreases in price support programs?

USDA/REE can help farmers faced with declines in price support programs by enabling them to diversify their production systems, add value to their products, lower input costs, develop alternative markets.

9. How can the appropriate Federal-State-Industry resource pools be integrated to develop high priority regional programs in research, teaching, and extension?

Funds should be allocated to the most agile and bureaucratically unencumbered of the partners to organize the integration. Private non-profit organizations have proven especially effective in partnerships to develop research and education for "public good" knowledge and technologies, i.e. those that don't generate a proprietary benefit for the producer of the knowledge or technology. When partnerships are to be undertaken with resource-rich private industries, the public institutions involved must ensure that the partnership is serving the broad public interest. If this can't be shown, the partnership should not proceed as it will leverage public funds for private interests.

12. What is the proper place for integrated systems programs? What role should the Extension Service (extension functions within CSREES) play in these programs?

The study and development of "integrated systems" (for example, integrating crops and livestock, and integrating multiple cropping or other farm-based enterprises) should be primary activities of the Agricultural Research Service and the competitive grants programs, especially SARE and the NRI. Extension should be working with farmers to take advantage of research information to develop integrated resource management systems that work for them.

13. Have USDA's research and extension advisory and coordinating boards been effective in planning and prioritizing agricultural research and extension? (please explain).

The primary advisory bodies, such as the Users Advisory Board and the Joint Council, have not been effective for several reasons. First, nothing requires the Secretary to be accountable to them in any way. Their work should be fully integrated with USDA planning procedures. Second, their charges are insufficiently integrated with the broadly stated national purposes for agricultural research and extension. They should help the Secretary decide how best to implement those purposes. Third, their membership has been too narrow, not representing the full range of agricultural producers and stakeholders.

The Agricultural Science and Technology Review Board (ASTRB) serves an important analytical role. Its mission is not to communicate immediate needs of constituencies but rather to analyze how more fundamental long term social goals can be advanced by USDA research and education programs. Its role is to analyze, for example, what research directions might do most to enhance economic opportunity in rural communities. ASTRB calls for appointees who can think analytically about the long term implications of research choices. The analytical role served by ASTRB has been the vital missing link in USDA programs. Despite inadequate funding, in its short life it has accomplished a good deal toward this mission. It has significantly influenced the research priorities stated by the Joint Council, it has developed a comprehensive technology assessment protocol which will be tested in the coming year by USDA and land-grant research programs. It has issued a report on its approach to conducting technology assessment. ASTRB should be retained as a separate body with more substantial funding.

15. What options should Congress consider to improve USDA's process for planning and prioritizing agricultural research? (i.e. how should the research agenda be prioritized?)

Congress could encourage USDA to develop:

** Research planning and priority setting processes designed to support areas of research that can make major contributions to the purposes.
** Program evaluation and proposal review procedures that consider contribution to the purposes and outcomes. This should include overhaul of the Current Research Information System so that entries enable evaluation of research priorities, results and outcomes.

** Technology assessments that illuminate links between research directions, technology development, and social, economic or environmental impacts; and procedures for utilizing assessments in planning and evaluation.
** Effective communication of the purposes and defined outcomes to researchers.
** Hiring, promotion and reward policies that recognize significant contributions to fulfilling the research purposes.
** Inclusion of a broad range of stakeholders in research planning and evaluation, and some accountability of the Secretary to those advisors.

18. What is the most appropriate mix of Federally funded basic and applied agricultural research?

It is not appropriate to determine the best mix of basic and applied research *a priori*. Research should be organized as needed to solve problems. In general, USDA funded basic research agendas should emerge from challenges and questions confronted by applied and farmer or community research attempting to solve significant problems that confront producers (of every variety and in every context) and rural communities. Applied research that serves broad interests, research that won't be funded for proprietary benefit by private industry, is an important function for federal funding of research.

19. How, if at all, can the effectiveness and efficiency of agricultural research be enhanced at current funding levels? At reduced funding levels?

The effectiveness of agricultural research can be enhanced by promoting greater interaction and dialogue between scientists and their customers and stakeholders to ensure the relevance and usefulness of the research. It also can be enhanced by planning more strategically to achieve national goals. Efficiency can be enhanced by providing longer term grants so scientists can focus on their research, and avoid spend inordinate time writing the next grant proposal. Efficiency and effectiveness both can be improved by ensuring greater connection and integration of basic and applied research, and of research and extension functions.

Efficiency could also be enhanced by reducing duplication, and improving the flow of information between states. For example, it may be unnecessary for Iowa to have a serious dairy research program, and for Wisconsin to have an active swine research program, if resources and information can be share adequately between the two states. It may be appropriate in some cases to regionalize extension services, or provide telephone "hot lines" for regionally relevant topics

21. In view of the growing emphasis on greater accountability of Federal expenditures, do you have any suggestions as to how agricultural research results can be measured and their impact evaluated? Is there some standard of accountability for the efficient and effective use of Federal research funds?

Achieving accountability requires an understanding of how and why different research

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directions lead to different societal outcomes. Developing consistent criteria of evaluation will require substantial effort in the area of research and technology assessment which will require ample federal funds clearly directed to achieve this understanding. Impacts to be assessed should include economic criteria such as the opportunities for farmers and rural communities to add value and earn profits from agricultural products, the impact on enterprise flexibility and diversity, capital requirements, impacts on management and labor processes -- such as whether the technologies will be suitable for owner-operated farms and businesses, and employment or self-employment impacts.

A good program of research and technology assessments should be able to identify patterns and criteria according to which research impacts can be evaluated.

Measuring impacts in the aggregate will require an improved system of reporting that includes impact criteria, and training for scientists so that they will be able to recognize and project the real world outcomes of their work. Evaluation of impacts should be integrated into project and personnel review procedures, and scientists should be encouraged to design their research, to the best of their knowledge and ability, to achieve the desired societal outcomes. Diverse users, stakeholders and members of the public should be involved in program reviews. Citizen review, conducted in the context of the national research and extension purposes, should serve as the primary standard of accountability for the efficient and effective use of Federal research funds.

22. What is the proper balance between in-house, formula funds, competitive grants, and special grants?

It is very useful for the universities to have some unrestricted dollars (Hatch funds) to allocate for high-risk creative research, start-up resources for new faculty, and research that is very locally specific. The level of Hatch funds should not be reduced, and perhaps should be increased. Competitive grants are a very useful way to promote research targeted to address national concerns (for example, sustainable agriculture). Competitive funds could usefully be increased. The proportion of in-house funds may be larger than is useful. There seems to be an over-abundance of bureaucratic overhead in the Agricultural Research Service, and possibly redundancy between state-based federal laboratories and university resources. In addition, many ARS resources are inefficiently allocated due to micro-managing by appropriations committees in Congress. Moreover, farmers seldom identify ARS scientists and laboratories as an important source of information. ARS should be better linked and responsive to regional groups of farmers (of all varieties) and other stakeholders.

27. In order of priority, what would be the most significant actions USDA could take to improve its management and/or delivery of agricultural research?

USDA could significantly improve its management and delivery of agricultural research through effective outcome-based planning to achieve the purposes for research and extension that have been identified by Congress. The full range of interested stakeholders should be effectively involved in review and planning. The planning process should utilize research and technology assessments to identify priority research areas that are consistent with the desired societal outcomes.

30. What is the continuing role of Land Grant Universities? 1890's Colleges? 1994 Colleges?

The role of the Land Grant Universities is to serve public needs for research and education, particularly but not exclusively in agriculture. They should especially serve those citizens, organizations and businesses that are resource-poor and whose needs are not being met by private industry. Their special mission, vis-à-vis other public universities, should be to help society develop sustainable, equitable and healthful food systems, and achieve a stable and vital rural economy.

31. Is the current formula used for allocating Federal funds to land grant universities fair, reasonable, and does it address changing conditions? If not, how could it be improved?

If cuts in formula funds are absolutely necessary, those cuts should not be borne disproportionately by the 1890 colleges which only recently are beginning to approach parity.

36. As societal concerns about natural resource use, rural development, animal well being, etc. are integrated into the USDA agenda, is there a role for "new" partnerships with the Federal sector?

New partners very much need to be brought into research and education activities and priority-setting processes. These new partners should include environmental, rural development and sustainable agriculture organizations, animal protection organizations, anti-hunger groups and farmworker organizations.

41. Should the USDA have research laboratories or should it provide competitive funding to existing entities such as universities?

USDA research laboratories can be important to facilitate long-term research, and areas of research that are not readily fundable under competitive grants. Examples would be research projects that are too large, complex and multidisciplinary, or fill an important need and necessary function (e.g. plant breeding, or adaptive research) but are not necessarily "cutting edge". The latter seems to be the prime criterion of funding through the National Research Initiative. We believe the NRI has had too narrow a focus, but in any case it seems unrealistic to expect it to fund research that is necessary and serves clients but is unexciting. Such research as plant breeding probably does not require a competitive structure to be competent and fill the need.

44. The USDA Extension Service's (ES) mission is, among other things, to disseminate

research results to farmers and other customers. In your opinion, is the ES effective in carrying out this mission? (please explain).

The Extension Service has been rather ineffective in assisting farmers who wish to adopt farming practices that emphasize stewardship, cost reduction and low capital requirements. Research results published in Planting the Future: Developing an Agriculture that Sustains Land and Community, suggest that such farmers have found more useful information from conducting their own on-farm research, soliciting information from their colleagues, and working with non-profit mutual support organizations. Extension was ranked fairly low as a source these farmers turn to and find useful (see attached two-page article from the newsletter of the Consortium for Sustainable Agriculture Research and Education).

Extension would do well to adopt some of the methods of these private organizations (or contract with them). For example, Extension agents would probably better serve farmers and rural communities acting as organizers of community initiatives, and facilitators of on-farm research and farmer networks, serving as information brokers in the process, rather than attempting to "transfer" whole technology packages or serve as resident expert.

45. Should the ES be involved in addressing the problems and challenges confronting urban populations?

Where other programs are meeting the need, it may not be appropriate for Cooperative Extension to be the sponsoring agency to support urban populations, except perhaps where improving local food systems and reducing the incidence of hunger and malnutrition are concerned. Land-grant universities as a whole (and not just colleges of agriculture) should be addressing these needs, for example sponsoring community-based participatory research.

46. What if any role should ES play in dealing with the social issues facing farmers and rural communities?

The Extension Service should help promote rural community development, for example through locally-owned value-added enterprises based on diversified farming systems, assisting with cooperative marketing, and supporting micro-enterprise revolving loan funds. Extension could help rural communities organize to develop their entrepreneurial capacity, and it could assist average or resource-poor farmers to engage in cooperative and/or entrepreneurial schemes to improve their economic position in the market, and make more efficient use of their management and skills to profit from a given set of resources.

47. Should the ES's mission statement be changed to focus activities on production agriculture?

The Extension Service's mission should not focus exclusively on agricultural production, but should include rural community development. Its role should be less one of providing expertise and education, and more one of organizers and facilitators, e.g. for farmer information-sharing networks, linking farmers and researchers, and helping rural communities identify their needs and pursue development opportunities.

48. What should ES not be involved in?

The Extension Service should not be engaged in services that are redundant with those provided by other public agencies.

49. Do you have any suggestions on how USDA's dissemination of Federal agricultural research results can be improved?

If research addresses real and expressed needs, then the dissemination vehicles of user groups likely will do the best job of dissemination and they should be encouraged to do so.

In terms of dissemination to research colleagues in the universities (as well as to users), the in-house research agencies tend to be far too insular. ERS and ARS scientists are not in active circulation -- for example, they don't regularly visit university departments to give colloquia on their work, or offer workshops at farming conferences. To ensure the quality and relevance of their work, they need far more interaction with both colleagues and customers/stakeholders. They should be required to engage in these kinds of "dissemination" and be rewarded for doing so.

52. In your opinion, is CRIS effective in helping you obtain information on Federal agricultural research projects? If not, what changes are needed to this information system that would provide quality data on Federal and State agricultural research? (please explain).

The CRIS keywords are inadequate to guide users to the information they seek. Also the descriptions of research are not user-friendly, and they don't identify the national purposes the research is to advance. Nor do they effectively identify results, and certainly not concrete outcomes.

53. Is there/should there be an appropriate and adequate management information system(s) in place to report and collate results from Federal investments in research, extension, and higher education sponsored by the USDA (and related research agencies?).

Yes, there should be.

54. Does the CRIS system and other USDA reporting systems provide an adequate accounting of the research and extension work that is being done in America?

No.

REAVIS FARMS, INC.
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Nov. 3, 1995

U. S. House of Representatives
Committee on Agriculture
1301 Longworth Building
Washington, D.C.

Dear Sirs:

Enclosed are some opinions on questions 55-57 under International Relations, Agricultural Research, Education, & Extension Questions for Discussion.

We believe that research is extremely important to the agricultural producer. It is what enables us to be, if not the best, among the best farmers in the world providing abundant food, safe food, at low prices for the American consumer.

Here in the Rio Grande Valley, Extension Service works well with ARS personnel, especially since both offices are located on the same property. Valuable research is done on the africanized honeybee and ongoing research for the boll weevil eradication will soon put an end to the pest, we hope. Another example of good working relationships is Dr. Pike's Vegetable Improvement Center at Texas A&M University, College Station, Texas. He brings the focus of various disciplines within the research community, both public and private, to work together on the same problem; the result being that the problem is solved faster and more efficiently.

We hope that research funds will continue to be provided sufficiently to keep the U.S. farmer ahead in technology of all the farmers in the world.

Sincerely,

Mrs. Randy Reavis

Enclosure

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1. How can the USDA be most effective in the short and long term through its support of international activities?

The USDA could sign memoranda of understanding or cooperative agreements with similiar agencies of government in other countries, covering the range of activities in which the two parties have the most in common regarding types of farming, soils, weather, vegetation, etc. Not to be overlooked are common goals and ideals in the realms of democratic forms of government, human rights, education, income distribution, ecological concerns, and health and human welfare. Comjparative advantages in agricultural production , processing, and marketing should be the criterion also for placing USDA support in other countries.

2. Currently, USAID and other programs extend agriculture and agricultural development beyond the nation's borders. What continued or expanded role should USDA play in international research, education, and extension?

USDA has long participated in international development, one of the principal means for doing so has been through their Office of International Cooperation and Development (OICD), Under this arrangement, particularly in the case of USAID requests for assistance, suitable persons with the necessary expertise in research and extension, particularly, are recruited from their respective agencies (Soil Conservation Service, Economic Research Service, APHIS, Agricultural Research Service, etc.) for short-term and sometimes long-term assignments in other countries, this supported through USAID funding. OICD, at least in the past, has participated in the International Training Programs supported by USDA for foreign students to come to Washington or to designated land grant universities and received short or long-term training. Some of these programs include graduate studies leading to advanced degrees. This program is particularly beneficial, for many of the returning students take up positions in government upon completion of their studies and return to their respective countries. This role of USDA could be expanded to the mutual benefit of all concerned.

3. What is the role of USAID in funding ag. research and exatension? Has USAID maintained suport for agriculture or has the agency moved away from ag. related programs? What is the role of long-term ag. Res. & Dev. in developing countries in developing new markets for U.S. products? Should USAID contract through USDA/REE for long-term ag. R&D?

USAID contracts with USDA through OICD and with the International Agricultural Programs Office at various land grant universities to provide the necessary research and extension (and teaching) services, paid for by USAID. USAID also has a function in providing financial assistance in developing the infrastructure required for providing the ag. research and extension assistance (schools, research stations and facilities, extension centers, farm related equipment -- irrigation, drainage--in addition to tractors, plows, etc., and seeds , pesticides, herbicides, fertilizers, etc.).

USAID has moved away from agricultural concerns in the past, mainly in an attempt to improve the educational scene generally, and is an effort that could be maintained for general development purposes. USAID investment in improving the structure and efficiency of government is also an issue to the side, but eventually is one that benefits agrcultural interests as well. Much effort on USAID's part of late is devoted toward structural adjustment activities as proscribed by the International Monetary Fund of the World Bank, the main activities being reducing government expenditures on government

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and the military by reducing the number of personnel and the expenditures on arms. A prime concern in this effort is to remove government control of agricultural production and marketing by emphasizing investments in privatization of farms and marketing facilites and functions owned and operated by government. These efforts require what seems to be a move away from USAID's agricultural interests, but in fact these are necessary to facilitate agricultural development and development generally. Additional investment by USAID in agricultural policy programs and policy programs in general seem to be in the offing, and while these may appear to be unrelated to specific agicultural needs, they may in fact provide the climate for additional agricultural development within the context of more private initiative and less government involvement. USDA/REE involvement in developing new markets for U.S. products could well benefit the agricultural sectors of the USA and foreign countries, provided this assistance is backed up with sound economic , political, and socicological analyses in addition to assistance in the biologically technical fields.

AMERICAN FEED INDUSTRY ASSOCIATION

COMMENTS BY THE AMERICAN FEED INDUSTRY ASSOCIATION ON NATIONAL AGRICULTURAL RESEARCH PROGRAMS TO THE HOUSE COMMITTEE ON AGRICULTURE

The American Feed Industry Assn. (AFIA) submits these comments in response to a July 12, 1995 request from senior members of the House Committee on Agriculture. AFIA is the national trade association representing manufacturers of both medicated and non-medicated animal feeds. AFIA's members produce more than 70% of the commercial livestock, poultry, and aquaculture feeds sold in the United States. AFIA's members also manufacture and distribute feed ingredients, feed manufacturing machinery, and animal health products.

AFIA was a sponsor and strongly supports the Fair '95 goals for federal agricultural research. AFIA believes this is an important document, because it engenders the industry input necessary to develop and achieve goals in agricultural research.

The Fair '95 document provides an excellent model for achievable goals in federal agricultural research. However, AFIA has several concerns regarding these goals. Any scientist involved in federally-funded agricultural research should be held accountable for using the funding in an efficient manner, conducting the highest level of research, submitting that research to peer-reviewed panels or journals, and seeing that research, if applicable, will be delivered to the users for which that research was done.

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Industry input from all segments of agribusiness is vital to assuring that research meets the needs of the user and producer community. AFIA strongly urges Congress to adopt language to ensure that agricultural research units have industry-producer advisory committees. This will assure that agricultural research goals, which benefit American agriculture, will receive appropriate input from the principal users of the research product.

Agricultural research should be geared toward problem solving and not toward regulatory issues. There should be cooperation between federal and state agencies conducting research, and between federal agencies involved in similar agricultural research initiatives. Finally, once agricultural goals are met or research products are developed, the federal government should fund information systems that efficiently and effectively deliver research products to the producers and users of the research, such that the research will foster competitive environments worldwide.

AFIA believes the current federal/state cooperative efforts are adequate to address research priorities. The placement of ARS research laboratories at academic centers has been a hallmark of American agricultural research, and these efforts should not only be continued, but enhanced. Such cooperation between ARS and the land grant universities offers excellent opportunity for research and information exchange as well as tremendous opportunities for graduate education.

AFIA believes any non-funded advisory board should be eliminated. Any advisory boards created should be adhoc in nature and issue-specific, with a stated termination goal subject to extension and extenuating circumstances. These advisory boards should have adequate representation by the agribusiness community, including producers.

In partnering federal/state agricultural research with agribusiness, Congress should encourage other commercial cooperation. Equipment, animals, feed, even personnel can be important inputs to federal agricultural research programs. Too often in American agricultural research, professional societies, agribusiness industrial scientists, trained at land grant institutions, must take a back seat to federal and/or state researchers in peer-reviewing research that will be utilized within the agribusiness sector. Many of America's premier agribusiness corporations have large and growing agricultural research facilities that rival the best of federally-funded facilities.

Federal agricultural scientists should be encouraged to partner with their agribusiness counterparts in order to achieve the maximum benefit to the producer and users of agricultural research. With a balanced budget, initiatives and reductions in funding in all federal programs, Congress should encourage agricultural research projects that result in regionalized, multi-university efforts with industry input. With a limited amount of federally-funded agricultural research, AFIA believes state and federal government can no longer afford to fund agricultural research in all disciplines, in every state and location. A statute that encourages competitive grant funding for multi-facility agricultural research sites can only make better use of limited funding sources.

Recently, AFIA has become concerned about the outside activity of some extension service scientists. Frequently, the line between extension and consulting has become blurred, and many extension agents are providing services for fees that significantly and negatively impact on the agribusiness community. Moreover, many extension agents are promoting solutions to animal production problems that have not been peer-reviewed and frequently are at odds with agribusiness. The extension service should be the primary

American institution for transferring technology of the federal agricultural research industrial complex. USDA should be aware that corporate business taxes fund and support the agricultural research facilities. They are also principal users of the research developed for the producer community. Congress should strongly encourage cooperative ventures between agricultural research, agribusiness, and the producer community, such that the extension service provides the information highway for transferring such cooperative research.

Regarding funding for agricultural research, AFIA believes federally-funded research is essential to effective dealing with agriculture production problems. Moreover, the federal government should be the principal research entity for basic research as the turnaround and benefits from such research are slow to reach the application stage. It is difficult to determine at what level basic research should be funded by the federal government; however, AFIA believes the majority of federally-funded agricultural research should be applied to problem solving, i.e., applied research.

AFIA strongly supports competitive bidding for agricultural research projects. Funding for such competitive projects should be increased substantially. Congress should encourage competitive matching grants with industry input as a consideration in competitive match.

Of concern to the feed industry are multi-year agricultural research programs for which funding must be granted annually. As basic research projects are usually long-term and result in gradual, incremental steps, Congress should find a way to fund multi-year programs by assuring a continuous flow of funding for large multi-year basic research projects.

Obviously, AFIA believes USDA should have a strong research lab capability. The reduction in the number of scientists in recent years at the federal level is serious. This decline concerns the feed industry, which relies on basic research in nutrition and bioavailabity of nutrients to provide advances in feed formulation to the producer community. Further reductions in federal funding for agricultural research will certainly lead to a less competitive environment for American agricultural products worldwide.

AMERICAN OAT ASSOCIATION
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27 October 1995

U.S. House of Representatives
House Agriculture Committee
Att: Dr. John Goldberg
Agriculture Committee Staff
1301 Longworth House Office Building
Washington, D.C. 20515

Dear Member of the House Agriculture Committee:

RE: AGRICULTURAL RESEARCH, EDUCATION AND EXTENSION
QUESTIONS FOR DISCUSSION

The American Oat Association is extremely interested in preserving agricultural research funding for the future of the producers, consumers and industry in this country. In this time of transition in farm policy, we must not lose sight of the importance of funding agricultural research. Partisan politics may ultimately reduce funding for agricultural commodity programs, but the partisan bickering must not be allowed to infringe on the future of this country as it relates to research funding. We must continue to fund government research programs at USDA Agriculture Research Service sites as well as at land grant universities. We must also continue to seek input from users of research through advisory boards and counsels.

Our organization received the list of fifty seven questions for discussion. Although we appreciate the Committee's good intentions in seeking input on the research, education and extension appropriations process, we are dismayed by the number and the specificity of the questions. We are concerned that the Committee is basically discouraging response by asking a volume of questions, some of which are specifically technical in nature. Rather than respond to specific technical questions, we have elected to make a statement regarding the need for agricultural research.

We must not sacrifice agricultural research funding in this time of political upheaval. Food security and the future of the country are at stake. Our citizens have basically lost the awareness of the importance of taxpayer dollars supporting agricultural production. Congress is elected by taxpayers, most of whom have very little connection to the importance of securing the current and future national food supply. It is incumbent upon the members of the House Agriculture Committee to join those of us in agriculture who are working to raise the awareness of our citizens as to the continuing importance of agricultural production and agricultural research.

Sincerely,

Pat Henderson

Pat Henderson
Executive Director

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